

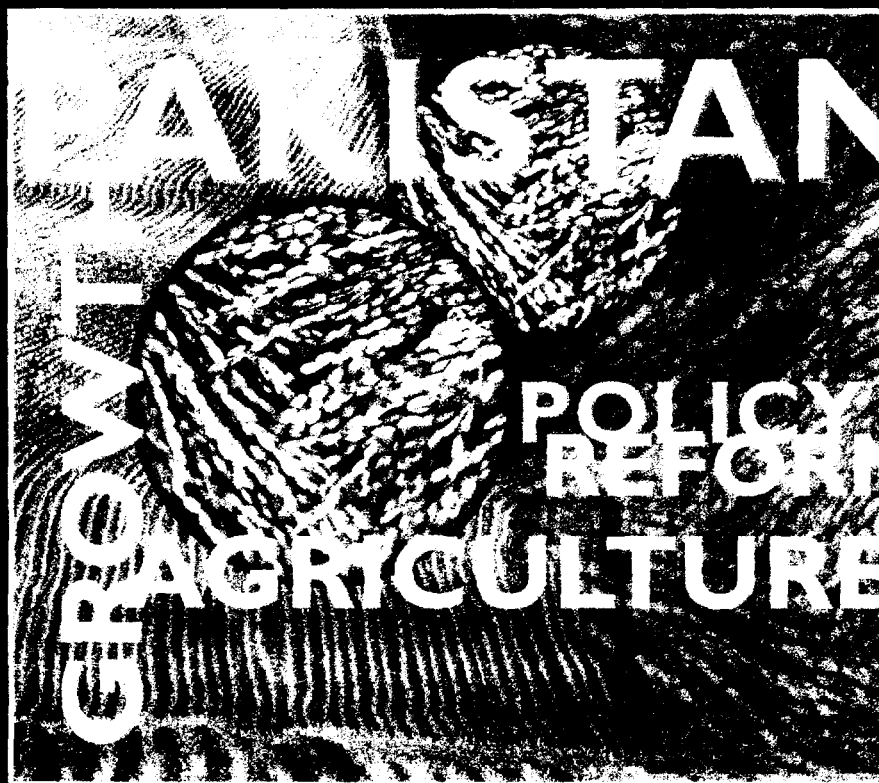


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Strategic Reforms for Agricultural Growth in Pakistan

Edited by
Rashid Faruquee



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Strategic Reforms for Agricultural Growth in Pakistan

Edited by
Rashid Faruquee

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Contents

Foreword v

1. Agriculture in Pakistan: Its Role, Performance, and Constraints 1
Rashid Faruquee
2. Removing Policy Distortions and Redefining the Role of Government 23
Rashid Faruquee
3. Phasing Out Public Enterprises in Agriculture 45
Rashid Faruquee, Ridwan Ali, and Yusuf Choudhry
4. Reforming the Agrarian Land Market 69
Moazam Mahmood
5. Improving Irrigation and Drainage 87
Masood Ahmad and Rashid Faruquee
6. Improving Rural Finance 109
Saeed Qureshi, Ijaz Nabi, and Rashid Faruquee
7. Developing a Comprehensive Strategy for Reform 143
Rashid Faruquee

References 149

Foreword

Agriculture plays an important role in generating economic growth, and increased agricultural productivity tends to increase rural employment and help alleviate poverty. This book assesses the past performance of Pakistan's agriculture sector, analyses the major issues and constraints facing the sector in recent years, and proposes a strategy for accelerating and sustaining growth in the coming decades. The comprehensive and practical analytical framework presented here by Pakistani scholars and World Bank staff is a useful tool for decisionmakers in designing and implementing policy reforms. The policy lessons outlined in this volume, which are relevant for many developing countries, have been widely disseminated by WBI in its seminars and courses on rural development.

Vinod Thomas
Director
World Bank Institute

1

Agriculture in Pakistan: Its Role, Performance, and Constraints

Rashid Faruquee

Pakistan is a relatively poor country, with per capita income of only US\$460 in 1995. Economic growth has been strong, however, averaging 6 percent a year since the late 1960s. Although the share of agriculture in the economy has been slowly decreasing (and that of industry slowly increasing), agriculture remains the backbone of the economy, employing more than half the labor force and accounting for 70 percent of export revenues, directly or indirectly. Agriculture also affects economic growth, structural adjustment, internal and external balances, poverty reduction, and natural resource management significantly. This chapter demonstrates the importance of the agriculture sector in Pakistan while showing that its performance has been restricted by various policy distortions.

Agriculture and the Economy

Agriculture plays an important role—both directly and indirectly—in generating economic growth. A study of Asian countries in which agriculture is economically important found that a 1 percent increase in per capita agricultural growth led to a 1.5 percent increase in per capita nonagricultural growth (Mellor 1994). Increases in agricultural growth led to even larger increases in nonagricultural growth for two reasons. First, agriculture has strong backward linkages to farm inputs, such as chemicals, fertilizers, and machinery, and forward linkages to food and fiber processing. Second, increases in agricultural incomes are usually spent on locally produced goods and services, which have high income elasticities of demand and generate employment. Thus, increased agricultural productivity, which is correlated with overall economic growth, tends to increase rural employment and alleviate poverty.

Agriculture and Economic Growth

Agriculture provided a significant boost to Pakistan's overall economic growth during the late 1980s and early 1990s (table 1.1). Between 1985 and 1995 agricultural growth averaged about 4 percent a year, or 1 percent a year in per capita terms (Pakistan's population grew by 3 percent a year). Assuming that per capita nonagricultural income growth of 1.5 percent is generated by every 1 percent increase in agricultural income, 1 percent per capita actual agricultural growth was expected to generate 1.5 percent per capita nonagricultural growth, or an increase of 4.5 percent in overall nonagricultural growth; the actual growth rate was 5.2 percent. Within the nonagricultural sector, manufacturing, especially industries with strong linkages to agriculture, food and beverage processing, tobacco, textiles, and clothing, appears to have benefited the most from agricultural expansion.

The importance of agriculture to the economy can also be seen during periods of sudden decline in agricultural production. The rain and flooding that occurred in the summer of 1992 destroyed about 10 percent of the sugarcane crop, 15 percent of the cotton and rice crops, and an even greater portion of some smaller scale food crops. As a result agricultural exports plummeted and were largely responsible for the 3.2 percent drop in gross domestic product (GDP) that year. In 1994 cotton yields were reduced by a crop

Table 1.1. *Agriculture and Economic Growth in Selected Asian Countries, 1960–95*
(annual percentage growth)

Country	Gross domestic product			Agriculture		
	1960–70	1970–80	1980–95	1960–70	1970–80	1980–95
China	5.2	5.8	9.1	1.6	3.2	5.6
India	3.4	3.4	5.0	1.9	1.8	3.1
Indonesia	3.9	7.2	5.9	2.7	4.1	3.3
Korea, Republic of	8.6	9.6	9.2	4.4	2.7	2.1
Malaysia	6.5	7.9	6.3	—	5.0	3.7
Pakistan	6.7	4.9	5.9	4.9	2.3	4.3
Thailand	8.4	7.1	8.4	5.6	4.4	3.7

— Not available.

Source: World Bank, *World Development Report*, various years.

virus, and wheat yields were low because of an unusually warm and dry winter. These events led to significantly lower agricultural growth than the average annual growth of the previous 10 years.

Evidence of strong linkages between agriculture and the nonfarm sector was presented by Vogel (1994) using a social accounting matrix. Wheat, rice, and sugar production have forward linkages close to 2, indicating that every unit of value produced from these crops generates almost two additional units of value to forward sectors, such as crop processing and manufacturing. Backward linkages were estimated at 1.2 to 1.4, indicating that every unit of value added in agricultural production generates 1.2 to 1.4 additional units of value in farm inputs, such as pesticides, fertilizers, and veterinary services.

Agriculture and the Structural Adjustment Program

Pakistan is in the middle of an adjustment program, a program in which agriculture plays an important role. Government involvement in agriculture has been excessive and often inappropriate—particularly in regard to marketing restrictions, subsidies, and parastatals—and agricultural reforms are a key part of the adjustment program, which is discussed in chapter 2. Improved agricultural performance can contribute to the success of the overall program, both in terms of growth and in terms of correcting the internal and external imbalances the adjustment program seeks to address. The adjustment process itself affects agricultural performance, sometimes adversely in the initial phase. Successful implementation of the adjustment program will depend on how this initial impact is handled.

Growing macroeconomic imbalances, inappropriate policies, and structural weaknesses are the main factors that led to the introduction of an adjustment program (box 1.1). For Pakistan the principal goals of the program include ensuring a sound and sustainable macroeconomic framework with sustainable internal and external balances, liberalizing trade, privatizing government-owned enterprises, deregulating and eliminating public sector monopolies, and reforming the financial sector. The program also aims to improve fiscal accounts by introducing a general sales tax, withholding on income taxes, and spending cuts. Demand management remains a problem, as large budget deficits and inflationary pressures persist.

Reforms in the agricultural sector are aimed at ensuring that agricultural prices reflect actual costs, not costs created by policy distortions. Agricultural marketing functions and trade are being liberalized so that farmers have the benefit of world prices and input markets are unhindered by the public sector. These reforms will be key to achieving overall economic efficiency. Consistent with the overall goals of adjustment, these reforms will also expand the role of the private sector through deregulation, liberalization, and privatization, affecting many public input supply and output marketing corporations that now operate in the agriculture sector. Instead of performing the tasks for which they were established, many public corporations have caused delays in the marketing chain for agricultural commodities and farm

Box 1.1. The Purpose of Adjustment Programs

Structural adjustment programs are economic reform programs designed to eliminate distortions sometimes created or exacerbated by internal and external shocks that prevent efficient allocation of resources to help resume growth.

Distortions commonly addressed by adjustment programs include an overvalued exchange rate, high current account and fiscal deficits, low factor mobility, restrictions on domestic and foreign trade, and distorted pricing for tradable and public sector services. Common elements of adjustment programs include the following:

- Exchange rate reforms that, through timely adjustments in nominal exchange rates and maintenance of domestic price stability, encourage long-term expansion and diversification of exports
- Interest rate and financial sector policy reforms that result in competitive returns on financial assets, enhance the marginal productivity of capital, and may raise the propensity to save
- Tax reforms that broaden the tax base by eliminating tax exemptions and concessions and improve tax administration to increase public revenues and reduce fiscal deficits
- Reform of produce pricing, agricultural marketing, public enterprises, and labor markets to enhance the mobility of goods and labor, make prices and wages more flexible, promote efficiency in the use of resources, and improve external competitiveness
- Trade policy reforms that, by reducing the average level and variance of tariff rates and liberalizing foreign trade, remove barriers to imported inputs, create uniform incentives, and eliminate discrimination against export-oriented activities.

Pakistan undertook several adjustment programs in 1993, 1994, and 1995. A major objective of such programs has been the attainment of an improved balance between resource availability and use through implementing reforms in trade, public finance, and public sector management.

inputs. These public corporations are also expensive to operate and inefficient, as discussed in chapter 3. The adjustment program will phase out government control of activities such as agricultural production and marketing that the private sector is better equipped to handle.

The outlook for agriculture depends largely on Pakistan's macroeconomic environment and the success of the adjustment program. Experience from other countries that have undergone similar adjustments shows that agriculture is sometimes hurt in the initial phase of structural adjustment but later benefits greatly from improved incentive structures and institutional changes brought about by structural reforms. Experiences of early reformers provide lessons on how adjustments should be implemented to reduce the disruption to agricultural performance and growth.

The experiences of Chile and New Zealand yield some important lessons for Pakistan (Faruquee 1995). First, they show that agriculture is highly sensitive to trade and macroeconomic policies, especially as they affect the exchange rate, which ultimately determines the competitiveness of exports and the cost of imports. Fiscal and monetary policies should thus be set so that the competitiveness of agriculture is not undermined by rapid inflation in prices and costs. Controlling inflation through high real interest rates, exchange rate appreciation, and cuts in government spending can put agriculture at a disadvantage, especially early on. But agriculture ultimately benefits as the reforms enhance the efficiency of the sectors—distribution, infrastructure, and finance—on which it depends.

Experiences also show that reforms should be made across sectors simultaneously. New Zealand's experience illustrates the adverse effects of spacing reforms and maintaining industrial protection while removing agricultural protection. Chile's experience points to the need for Pakistan to strengthen property and tenure rights and to create an active market for water. Experience from other countries shows that the private sector usually responds rapidly to the removal of the public marketing infrastructure. A swift move to deregulation could thus reduce transitional difficulties in the reform process. The debt burden of farmers requires careful attention, although the influence of structural adjustment may not be great in Pakistan, where much credit is obtained from the informal sector. Finally, special attention must be paid to the most disadvantaged farmers. Even in cases where reforms have been successful some smallholders

have been unable to reap the benefits of adjustment. Without special efforts to raise the productivity of these farmers, assistance will have to be provided for them to leave agriculture altogether.

Agriculture's Contribution to Internal and External Balances

The agricultural sector can contribute to the Pakistani economy in general, and to the adjustment program in particular, through its contribution to improving internal and external balances. Agriculture is essential for sustaining improvement in internal balances. The sector was a major contributor to Pakistan's poor performance in fiscal 1992 and 1993, largely because of required compensation for flood-related crop damage and the collapse of several credit cooperatives. But even in normal years agriculture contributes to the deficit through a wide range of costly subsidies. Most conspicuous is the subsidy on wheat flour consumption, a policy intended to improve the food security and real incomes of the poor. Less apparent are the hidden subsidies from noneconomic pricing of agricultural inputs, such as energy and water. Poor rates of cost recovery have compounded fiscal difficulties and left operations and maintenance expenditures severely underfunded. Government commitments to increase operations and maintenance expenditures can be fulfilled only if cost recovery improves dramatically.

Agriculture also has an important role to play on the revenue side. For many years tax revenues have stagnated at 12 to 14 percent of gross national product (GNP), considerably lower than in other East Asian economies. Tax revenues in 1995 were only 14 percent of GNP, compared with 22 percent in Malaysia, 21 percent in Sri Lanka and Indonesia. Pakistan's tax structure is based on indirect taxes (taxes on goods, services, and international transactions), which accounted for 76 percent of all tax revenues in 1995. Direct taxes (taxes on income, profits, capital gains, and social security) represented only 24 percent of total tax revenues, a much smaller percentage than in other countries, such as Indonesia, where direct taxes contributed 63 percent of total tax revenues, or Malaysia, where they provided almost half of total tax revenues in 1995. Pakistan's reliance on indirect taxes results in significant market distortion and requires reform.

Agriculture has the potential to make a larger contribution to total revenue. As of 1996 there was no federal tax on agricultural income and only minor provincial agricultural income taxes; agricultural land held by those exempt from income tax was not included as wealth for wealth tax purposes. Loopholes in the taxation system have created opportunities for tax evasion on income earned from nonagricultural sources. Beginning in fiscal 1996 the government responded by increasing the value of the producer index unit (PIU) for wealth tax purposes, thereby increasing revenues from agricultural wealth tax. Such efforts to find new revenue sources will become increasingly important as ongoing trade reforms result in a sizable loss of tariff revenues.

Agriculture also plays an important role in external balances. From the 1970s until the mid-1980s exports of raw agricultural commodities, in particular rice and cotton, contributed between 30 and 40 percent of the total value of exports, growing by about 10 percent a year over the period. Since the late 1980s the relative importance of primary commodity exports has declined, but they still represent 10 percent of total export earnings. The decline in the share of primary commodity exports is largely a result of the rapid growth in exports of manufactured agricultural products that rely on the farming sector as a source of raw materials. In 1995 manufactured agricultural products represented more than 40 percent of all exports, a significant increase since the early 1970s. Manufactured commodity exports have risen by 9 percent a year since the early 1990s, led by the growth of cotton cloth and leather exports.

Agriculture, Poverty, and Inequality

In Pakistan, as elsewhere, the poor are often marginal farmers or landless laborers whose main source of income is the rural nonfarm sector. Although the long-term solution for rural unemployment and underemployment lies in the adoption of a development strategy and economywide policies that do not penalize labor use and that generate rapidly growing productive employment outside agriculture (Srinivasan 1993), the farm sector plays an important role in poverty alleviation. Although agricultural income accounts for

just half of total income of poor households, dependence of the poor on agriculture is much greater because of the strong linkages between the farm and nonfarm sectors. In addition, the skewed distribution of land ownership in Pakistan means that agricultural incomes contribute to income inequality, whereas rural non-agricultural income tends to reduce inequality (Alderman and Garcia 1993).

Rural poverty levels in Pakistan are significantly higher than urban levels (table 1.2). Moreover, some urban poverty is the result of flight from rural areas, providing an additional incentive to ensure that agriculture and poverty interactions are managed properly.

Like other developing countries Pakistan has seen a decline in absolute poverty—from 54 percent of the rural population in the early 1960s to 23 percent in the mid-1980s (World Bank 1993). But despite growth rates that rival those of other East Asian countries, Pakistan was less successful in reducing poverty than some other countries, such as Indonesia and Malaysia (table 1.3). Indonesia's faster rate of poverty reduction was achieved largely through increased agricultural incomes: 60 to 70 percent of the decline in poverty between 1984 and 1987 came from households engaged primarily in agriculture (World Bank 1992a). Because population growth has been high in Pakistan, the number of poor has fallen by much less than elsewhere in East Asia. While Malaysia and Pakistan more than halved the percentage of the population below the poverty line, the number of poor fell by just 19 percent in Pakistan. By contrast, Pakistan seems to have done better than India (albeit over a longer time) in terms of reducing the percentage of the population living below the poverty line.

One reason agricultural growth in Pakistan did not reduce poverty as rapidly as in some other East Asian countries was that growth after the green revolution tended to be labor displacing because of mechanization. Pakistan's rate of poverty reduction would have been even more modest if migration to the Middle East had not absorbed a vast pool of rural labor. Some of this labor displacement was rooted in policy distortions (principally policies related to machinery and credit) that undermined the direct contribution of agricultural growth to poverty reduction.

Poverty can also be evaluated in terms of social indicators. Based on these measures Pakistan compares unfavorably with other South Asian and low-income countries. On all but one social indicator of poverty (access to sanitation), Pakistan's performance is significantly worse than that of India (table 1.4). A survey of

Table 1.2. *Estimates of Poverty in Pakistan*

Survey (year)	Measure of poverty (year)	Percentage of population living in poverty	
		Rural	Urban
Malik (1988)	Rupees per capita (1987/88)	24	19
Ahmad and Allison (1990)	Rupees per capita (1987/88)	20	16
Malik (1991)	Calorie intake (1990/91)	16	7
World Bank (1992)	Rupees per capita (1991/92)	36	28

Source: Srinivasan (1993) and World Bank (1994c).

Table 1.3. *Poverty Levels in Selected East Asian Countries*
(percentage of population below the poverty line)

Country (years)	First year	Last year
India (1972–83)	54	43
Indonesia (1972–82)	58	17
Malaysia (1973–87)	37	14
Pakistan (1984–92)	46	34

Source: World Bank (1995).

Table 1.4. *Social Indicators of Poverty in Pakistan and India*
(percent)

<i>Indicator</i>	<i>Pakistan</i>	<i>India</i>
Access to safe water	50	75
Access to sanitation	28	16
Male literacy	50	65
Female literacy	24	37
Male primary school enrollment	80	123
Female primary school enrollment	49	91

Note: Water and sanitation figures are for 1988–93. Literacy rates and enrollment rates are for 1993 and 1995 respectively. Enrollments are expressed as a percentage of the population in the relevant age group that is attending school and can exceed 100 percent if individuals from outside the age group attend primary school.

Source: World Bank (1996).

human capital investments found that investment in education in Pakistan has been low since 1970. Although farm growth and social indicators are not directly linked, the extent of poverty and the quality of human resources are likely to be correlated with agricultural performance. Improving health and education services would help to alleviate poverty and improve the productivity of the rural labor force.

Agricultural policy can affect the distribution of wealth and income in the sector. East Asian economies have benefited from the perception that the benefits of growth are widely shared. Widespread viable land holdings and the generation of employment opportunities in the sector distribute the benefits of agricultural growth. Concentrated land holdings or a subsidy regime that benefits mainly large farmers, as in Pakistan, results in a skewed distribution of the benefits of growth.

There is growing recognition that the neglected nonfarm and noncrop sectors can play an important role in alleviating rural poverty. Although many of the rural poor are landless, they are linked to agriculture through livestock ownership. Raising the productivity of the livestock sector and small-scale farmers, who farm areas of marginal land, is thus crucial to reducing poverty. For farmers who are too marginal for aggregate agricultural growth to affect their welfare appreciably, an appropriate objective might be to provide rural or urban nonfarm employment. Improvements in land and labor markets will be important in increasing such opportunities.

Agriculture and the Natural Resource Base

With virtually all available land and water now being used, pressure on the country's natural resource base is growing and environmental problems have already reached critical levels. Soil erosion and salinity have caused crop yields on what were once some of the most productive soils in Pakistan to dwindle. Forests are being depleted at alarming rates as land is cleared for fuelwood, for agricultural use, and as fodder for livestock. Rangelands are becoming increasingly degraded, some irreversibly, as a result of uncontrolled grazing of livestock, and the marine environment is stressed by industrial pollutants and increasing levels of salinity resulting from upstream irrigation development. The country's rich variety of plants and animals is being depleted and some are now threatened or in danger of extinction.

The important links between agriculture and natural resource management and environmental protection must be recognized and policies that encourage the development of sustainable systems of resource use must be developed. A depleted and polluted environment hurts the poor by increasing health problems and lowering the productivity of the natural resources off which they often must live. Waterborne diseases alone—the result of an unclean water supply—account for 60 percent of infant mortality in Pakistan. The short-time horizons imposed on the poor by their circumstances limit their scope for natural resource investments; lacking other means of diversifying risk, they tend to overexploit any available natural resources.

These problems are not an inevitable consequence of agricultural growth. A pattern of agricultural growth that avoids wasteful use of natural resources could do a better job of preserving the natural

resource base. Agricultural strategy will have to harness “win-win” strategies to reverse the downward spiral of worsening poverty and natural resource degradation.

Although agriculture commands a declining share of GDP as an economy develops, it continues to play a crucial role in preserving the environment because agriculture is the primary user of the natural resource base (land and water). Sustainability and natural resource management considerations must influence growth strategies, which need to focus on increasing crop yields in a less damaging way than in the past. To do so will require more emphasis on increasing knowledge about crop and resource management and less emphasis on chemical inputs and monocropping.

Performance and Potential of Agriculture

How has the agricultural sector in Pakistan performed in the past and how is it likely to perform in the future? A longer view of agricultural sector performance and sources of growth can help assess rapid growth and identify the sources of growth that can be tapped in the years to come.

Historical Trends in Agricultural Production

Agricultural growth rates in the 1960s, 1970s, 1980s, and early 1990s are shown in table 1.5. Strong growth during the 1960s was driven by several factors, including greater certainty in the use of irrigation water (as a result of an agreement with India), the introduction of productivity-enhancing fertilizer-seed packages, the introduction of tubewells and the electrification of rural areas, and policy changes that improved the profitability of farming. Growth during the 1970s dropped to 2.3 percent as a result of the uncertainty created by land reforms and their selective implementation in 1972 and 1977, severe climatic shocks, a cotton virus that depressed production for most of the decade, and political instability. The recovery in the 1980s and early 1990s can be attributed to the introduction of new cotton varieties and improved management techniques, as well as to a gradual improvement in economic incentives.

A breakdown of agricultural growth by subsector is shown in table 1.6. Between 1970/71 and 1994/95 agricultural GDP more than doubled, increasing from Rs 51 billion in 1970/71 to more than Rs 128 billion in 1994/95—steady growth of about 3 percent a year. Because of even faster growth in the nonagricultural sectors, the share of agriculture in total GDP declined from about 40 percent to 24 percent over the same period.

Important structural changes have taken place in the agricultural sector since 1970/71. Although crop production remains the largest contributor to agricultural GDP (62 percent in 1994/95), noncrop agriculture has grown significantly since the 1970s, with livestock contributing 33 percent and fisheries and forestry contributing 15 percent of agricultural GDP in 1994/95.

Structural changes have also taken place within the crop sector. By 1994/95 cotton had become almost as important as wheat in terms of value added, accounting for 28 percent of total crop earnings.

Table 1.5. *Average Annual Agricultural Growth, 1960–95*
(percent)

<i>Period</i>	<i>Average annual growth</i>
1959/60 to 1969/70	4.9
1969/70 to 1979/80	2.3
1979/80 to 1987/88	3.6
1988/89 to 1994/95	3.9

Note: Calculations to 1988 are taken from GNP at constant factor cost for 1959/60 under the national accounts methodology; growth is assumed to be continuously compounded. The change in the national income methodology after 1988 prevents us from presenting complete comparable figures since 1979/80. For this reason, figures are presented through to and since 1988.

Source: Government of Pakistan, *Economic Survey*, various years.

Table 1.6. Agricultural Performance in Pakistan by Subsector, 1970/71–1994/95
(billions of 1980 rupees)

Subsector	1970/71	1975/76	1980/81	1985/86	1990/91	1994/95
Crops	35.9	41.7	49.8	62.9	74.5	79.3
Wheat	12.5	13.8	16.1	20.2	21.7	24.7
Cotton	5.4	7.3	10.2	18.3	24.8	22.4
Sugar	7.2	7.5	8.7	7.9	10.3	13.1
Rice	7.2	7.7	8.5	8.6	9.8	10.5
Noncrops	15.6	18.5	23.6	30.6	40.0	48.9
Livestock	15.3	16.9	20.1	25.9	34.1	42.8
Fisheries	0.2	1.4	2.7	3.6	4.4	5.0
Total	51.4	60.2	76.4	93.5	114.5	128.2
Memorandum items						
Share of GDP (percent)						
All agriculture	40.4	32.9	29.2	25.0	25.1	24.0
Crops	28.2	22.8	19.8	16.8	16.3	14.9
Noncrops	12.2	10.1	9.4	8.2	8.8	9.1

Source: Government of Pakistan, *Economic Survey*, 1995.

Expansion of cotton caused a corresponding decline in the relative importance of rice, which fell to 13 percent of total crop earnings, and sugar, which fell to 16 percent of total crop earnings, both down from 20 percent in the early 1970s. The lesson from the early 1990s is that depending on cotton for strong export performance and economic stability may be unwise given its susceptibility to yield and price fluctuations (box 1.2). Productivity growth in other major crops is also leveling off and there have been few increases in productivity in crops other than cotton.

Wheat is the most important food grain in Pakistan and is estimated to contribute more than half of per capita caloric intake and 85 percent of total protein intake. Some wheat is also fed to livestock. The area under wheat increased from 7.4 million hectares in 1982/83 to about 8.2 million hectares in 1994/95. Yields also rose, from just under 1,700 kilograms per hectare in 1982/83 to more than 2,000 kilograms per

Box 1.2. Cotton and Growth

Growth in cotton production has been a dominant factor in Pakistan's agricultural growth since the early 1980s, with production almost tripling between 1984 and 1992. Growth in cotton was driven by the use of high-quality seed, increased pesticide use, and attractive incentives. Although international cotton prices fell by 29 percent between 1990 and 1992, the steady depreciation of the rupee and lower export duties contained the decline in Pakistan to about 12 percent.

The area under cotton cultivation in Pakistan rose from about 2.2 million hectares in the early 1980s to almost 3 million hectares in 1996. Most of the production increase was accounted for by the increase in yields: cotton (lint) yields more than doubled, from just over 360 kilograms per hectare in 1983 to more than 750 kilograms per hectare in 1992. A crop virus in 1993 and 1994 caused yields to fall to less than 500 kilograms per hectare. The primary consumer of cotton is the domestic textile industry, with domestic mills consuming about 1.6 million metric tons a year in 1995.

Part of the relationship between cotton growth and overall growth is direct: between 1989 and 1992 cotton production grew by more than 10 percent a year, contributing half of the overall growth in the crop sector and a third of overall agricultural growth. But there are also important downstream effects. When cotton is abundant the textile industry has the advantage of cheap local sourcing, saving transport costs. Conversely, when cotton is scarce (as in 1994) the textile industry faces significant availability problems, especially since cotton tends to be scarce in other countries at the same time.

hectare in 1994/95. The area under maize grew only slightly, from about 790,000 hectares in 1982/83 to 830,000 hectares in 1994/95. Maize yields increased modestly, from 1,250 kilograms per hectare to nearly 1,500 kilograms per hectare over the same period.

Rice production was flat between the early 1980s and 1992/93, with the area under rice fluctuating moderately around 2 million hectares since 1980. Yield growth fell from almost 1,750 kilograms per hectare in 1982/83 to just under 1,550 kilograms per hectare in 1992/93. Basmati yields declined by 15 percent and coarse and irri yields declined by 4 percent. More recently (1993/94 and 1995/96) high yields have led to record rice production levels of close to 4 million tons.

Like many other countries Pakistan has pushed for self-sufficiency in sugar, and production has increased slowly since the mid-1980s. About 0.85 million hectares have been under sugar since the early 1980s and yields have increased moderately, from 35,700 kilograms per hectare in 1982/83 to 46,747 kilograms per hectare in 1994/95.

The livestock subsector is less important than the crop subsector and remains largely uncommercialized. Many questions about performance and potential face the subsector (such as a possible tradeoff between the growth of crops and livestock) and further analysis is needed before sound policy recommendations can be made regarding its commercialization. Livestock production contributed about 33 percent of agricultural GDP in 1994/95. Between 1981/82 and 1994/95 the volume of red meat and milk production grew by 5 to 6 percent a year. The poultry industry was even more dynamic, growing by 12 to 13 percent a year during the early 1990s. In 1994/95 poultry accounted for almost 15 percent of total meat production, compared with 9 percent in 1984/85 and 6 percent in 1980/81. The most important animal product is milk, 70 percent of which comes from buffalo.

A favorable climate gives Pakistan a strong comparative advantage in horticulture, as indicated by the rapid growth of the subsector in the absence of policy interventions. The country's climatic zones give it an edge in several valuable niches in the horticulture market, notably off-season (relative to the European market) midwinter harvests, year-round tropical fruits, low-chilling temperate fruits (such as berries and some types of stone fruit), and high-chilling temperate fruits (stone fruit). But the perishability of horticultural products requires an efficient processing and marketing infrastructure, which is largely lacking in Pakistan.

Assessment of Performance

Between 1990 and 1995 the agricultural sector grew at about 3.0 percent annually—a rate that compares favorably with the Arab Republic of Egypt and India, but unfavorably with China, Thailand, and Indonesia (table 1.7). Closer inspection of the nature and sources of this growth raises concerns about its sustainability and casts doubt on the ability of the sector to grow by more than 3 to 4 percent a year in the future (Faruquee 1995). Concern is based on several factors. First, rapid population growth means that per

Table 1.7. *Annual Growth in Agriculture and Population in Egypt and Selected Asian Countries*
(percent)

Country	Agriculture 1990–95	Population 1970–95
China	4.1	1.4
Egypt	1.8	2.0
India	2.9	2.0
Indonesia	3.2	1.7
Pakistan	3.0	2.8
Thailand	3.2	1.7

Source: World Bank (1995).

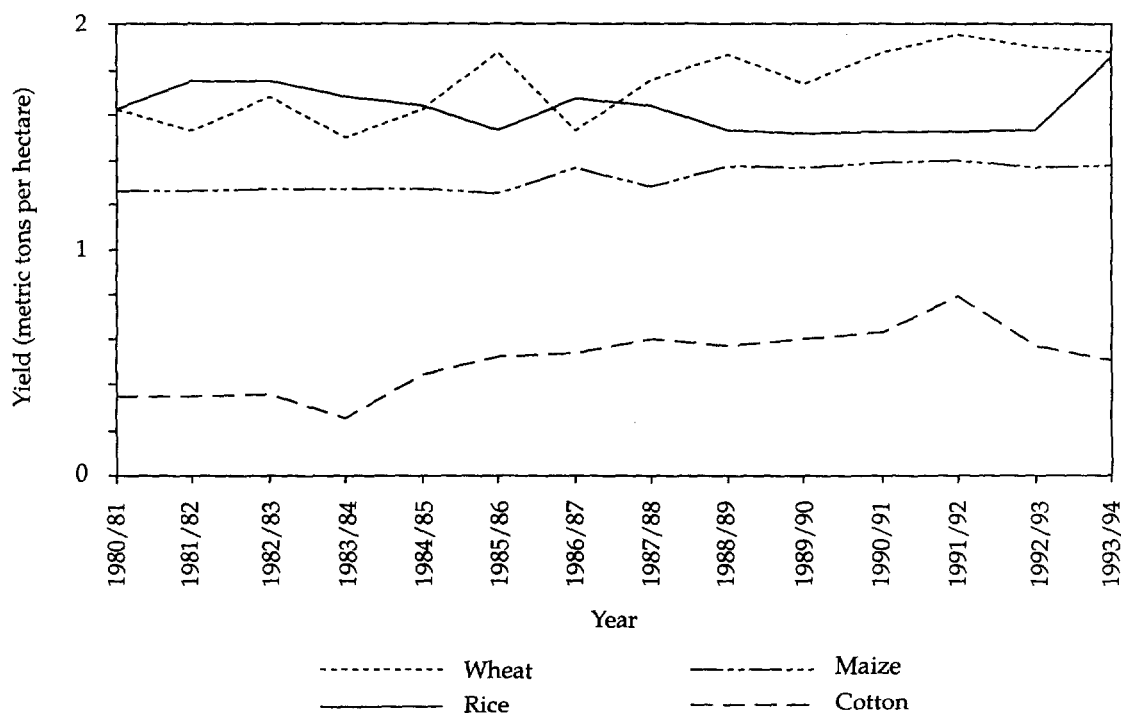
capita growth has been weaker in Pakistan than in other Asian countries, where strong agricultural growth has been maintained with much lower population growth. In China, for example, aggregate agricultural growth has been only about one percentage point higher than in Pakistan, but per capita growth has been much higher (3.6 percent compared with only 0.2 percent) because of lower population growth. In India aggregate agricultural growth was lower than in Pakistan, but per capita growth was higher than in Pakistan. Moreover, because Pakistan is comparatively well endowed with natural resources (arable land, water, and sunshine) and other favorable factors (a sizable domestic market and a favorable location) a faster rate of growth could have been expected.

Another characteristic of past growth is that it has come largely through more extensive rather than more intensive agriculture. The continued reliance on area expansion for growth indicates that technological progress in agriculture has been slow in recent years. Area expansion has encountered increasing constraints in Pakistan, as indicated by the country's low cropping intensity of 130 percent. Egypt, a country with strikingly similar resource endowments, has a cropping intensity of 180 percent. This partly explains why Pakistan, with an agricultural land base six times that of Egypt, has agricultural production that is less than twice as high.

The past performance of the agricultural sector should not be judged on production trends alone. Output growth relative to inputs—that is, productivity and productivity growth—also must be considered. Productivity growth in Pakistan has been measured by several different methods, all of which lead to the conclusion that production has been poor relative to input use for several years. One straightforward productivity measure is output per hectare (figure 1.1). For cotton and wheat output per hectare has risen in recent years; for maize and rice it has remained stagnant. Partial productivity measures (output per unit of a single factor) also suggest that productivity is much lower than in comparable countries, such as India and Egypt.

Another indicator of average productivity is yield gaps (the difference between average and best farmers' yields). Recent studies indicate that yield gaps in Pakistan are excessive. The yield gap for wheat

Figure 1.1. *Yield Trends for Four Major Crops in Pakistan, 1980/81–1993/94*



Source: Government of Pakistan, *Economic Survey*, various years.

is as high as 30 percent; for rice the figure is 50 percent (Byerlee 1990; Saleemi 1994). Such gaps are generally caused by the lack of timely inputs, insufficient water, and seed impurities.

The most reliable measure of productivity is total factor productivity, which compares an index of all outputs with an index of all inputs. Two recent studies (cited in Byerlee 1990) found that total factor productivity has either stagnated or declined in Pakistan since the mid-1970s. These studies suggest that the true contribution of agriculture to economic growth may have been considerably smaller than is suggested by the 4.4 percent increase in agricultural output that Pakistan experienced between 1980 and 1993. Ali and Velasco (1993) calculated total factor productivity by region and cropping system and found poor results for all major systems (table 1.8).

What factors lie behind the low levels of growth in agricultural productivity? Although no comprehensive studies analyzing the causes of low productivity and slow productivity growth have been undertaken, a few studies have examined the subject. Several studies (including Byerlee, Harrington, and Sharif 1991; Heisey 1990; and Hussain and Amir 1993) identified seed supply and distribution systems as major obstacles to yield increases for some crops, including wheat. Mahmood (1992) examined sources of productivity growth during different periods on a crop-by-crop basis and found that input and output price signals (which have been influenced by government policies) and levels of human capital affected productivity (table 1.9). They concluded that wheat yields stagnated in the pre-green revolution period of the early 1960s and increased during the green revolution (1960s to mid-1970s), even though the area under irrigation remained unchanged. During the 1980s yield growth dropped considerably, as a result of inefficient irrigation, distorted prices, and misguided macroeconomic policy, according to the study. Other variables found to have had an impact on the level and growth of productivity were deregulation of input markets, especially agrochemical, and technological change as well as the research that generates it.

Ali and Velasco (1993) attributed declining total factor productivity to resource degradation and found a clear correlation between intensification of input use across districts and resource quality. Intensification leads to resource degradation in several ways. Double-cropping affects the timing of crops in the rotation (such as the delayed planting of wheat in wheat-cotton systems) and may encourage the development of insect and pest diseases specific to each system. Such problems have been found with rice-wheat and cotton-wheat systems throughout South Asia. The use of modern inputs—such as tubewell water, which is unsuitable for crops because of its high salinity—may also contribute to degradation of the land, and increased machinery use may have increased soil compaction.

Byerlee and Akmal (1994) studied wheat yields between 1966 and 1986 and found that growth was less than expected from the application of green revolution inputs. They attributed the worse than expected performance to a decline in the quality of the resource base. Indicative of resource degradation is the fact that yields of high-yielding wheat varieties have not risen since 1970 despite the intensification of fertilizer use. Yields of high-yielding rice varieties rose only 0.2 percent a year between 1969 and 1981 and were stagnant between 1981 and 1990 (Mahmood 1992).

Table 1.8. *Annual Growth Rates in Total Factor Productivity in Various Cropping Systems in Pakistan, 1970/79 and 1980/89*

<i>System/region</i>	<i>1970–79</i>	<i>1980–89</i>
Wheat-cotton, Punjab	-0.62	0.01
Wheat-maize, Punjab	0.42	-8.79
Wheat-mixed, Punjab	-1.92	-1.53
Wheat-rice, Punjab	-2.00	-2.90
All Punjab	-1.30	-0.80
All Sindh	-0.50	-1.70

Source: Ali and Velasco (1993).

Table 1.9. *Decomposition of Crop Growth in Area and Yield Effects, 1961–89*

<i>Crop</i>	<i>Period</i>	<i>Area</i>	<i>Yield</i>	<i>Multiple</i>
Wheat	1961–67	111.4	-9.9	-1.5
	1967–76	13.7	75.7	10.6
	1976–89	40.0	47.3	12.7
Rice	1961–67	44.5	46.2	9.3
	1967–76	18.6	73.6	7.8
	1976–89	78.5	16.5	5.0
Cotton	1961–67	45.8	39.9	14.3
	1967–76	1.7	91.2	7.1
	1976–89	19.1	56.4	22.5

Note: The decomposition is $Q = AY$, where Q is output, A is area, and Y is yield. The change in output between any two years t and u , $t > u$, is $DQ = Q_t - Q_u$ and can be broken down as $DQ = Y_u DA + A_u DY + DY DA$. The effects sum to 100 for each crop in each period. For methodology on total factor productivity (TFP) calculation, see Byerlee (1990).

Source: Mahmood (1992).

Many of the past sources of agricultural growth in Pakistan appear to have been fully exploited. There is no possibility of a significant increase in total cultivable land or irrigation. At best a 10 percent expansion in water resources can be expected, and only at a prohibitive cost. With past sources of growth weakening, future growth will have to come predominantly from productivity growth, which will be achieved by allocating resources to crops in which Pakistan has a comparative advantage, improving the technical efficiency of inputs of each major crop, and increasing cropping intensity.

Prospects and Challenges for the Future

In formulating agricultural policy, the exportability of a country's specific commodities is compared to the prospective demand for the commodity within the country.

SUPPLY POTENTIAL. A country's comparative advantage in a commodity or product can be measured using the domestic resource cost (DRC), the ratio of domestic (nontraded) inputs to the value of foreign exchange per unit of the crop, all evaluated at opportunity cost. The DRCs for Pakistan's principal crops are shown in table 1.10.

Cotton, wheat, basmati rice, and livestock production all have the DRCs of less than 1, indicating that Pakistan has a comparative advantage in their production. Coarse rice and sunflowers are marginally inefficient (DRCs near 1); sugarcane and yellow maize are highly inefficient, at least for the indicated regions.

Table 1.10. *Trend Values of Domestic Resource Costs (DRC) for Major Crops, 1991/92*

<i>Crop, location</i>	<i>DRC</i>	<i>Crop, location</i>	<i>DRC</i>
Cotton, Multan	0.28	Wheat, Multan	0.68
Cotton, Nawabshah	0.26	Wheat, Gujranwala	0.29
Sunflowers, Multan	1.10	Wheat, Nawabshah	0.58
Yellow maize, Faisalabad	1.29	Basmati rice, Gujranwala	0.49
Coarse rice, Larkana	1.09	Sugarcane, Faisalabad	2.09
Broilers, Sindh	0.23	Sugarcane, Larkana	1.91
Broilers, Lahore	0.77	Sugarcane, Mardan	1.57

Note: The DRC is the ratio of domestic inputs to the value of foreign exchange per unit of the crop, evaluated at opportunity cost. A number greater than one indicates a lack of comparative advantage in that crop.

Source: Longmire and Debord (1993, table 16).

Although Pakistan has a strong comparative advantage in wheat, wheat imports are large and growing. Pakistani sugarcane appears to be extremely uncompetitive and the gain in productivity from switching water use to more efficient crops would be considerable. Overall, supply potential depends on moving production toward competitive crops and closing the large yield gaps described earlier.

DEMAND PROSPECTS. Pakistan's strong comparative advantage in wheat, basmati rice, and cotton suggests that these commodities will likely have the greatest production growth potential once market controls are removed. Prospects are also good for expansion of livestock and horticultural products. But production growth will be profitable for farmers only if there is strong market demand for these commodities; weak demand (domestically or internationally) could constrain production expansion. Once production increases and prices become competitive, exports will rise. How large are the markets for these products and how strong is future demand likely to be?

Food consumption patterns change as incomes rise and the move away from traditional staples, such as wheat and rice, toward higher-valued products, especially milk, meat, fruits, and vegetables, is already being observed. In 1969/70 cereals accounted for 18 percent of average consumer expenditure in Pakistan and milk accounted for 4 percent. Based on the most recent household expenditure survey (1990/91), cereals represent 19 percent and milk accounts for 18 percent of average consumer spending.

Population growth will also increase the demand for food commodities. Projections of future meat and animal product consumption for the 1993/94 to 2004/05 period show rapid growth in consumption of poultry and eggs (more than 5 percent a year in both cases), mutton (nearly 4.5 percent), fresh milk (4 percent), and beef (3 percent) (Akmal 1993).

Estimated growth rates for selected crops indicate that markets will exist in the future for those crops that Pakistan can produce efficiently (table 1.11). Demand for meat is projected to grow by 10 to 15 percent a year, demand for fruits and vegetables by about 10 percent a year, and demand for basmati rice by 8 to 12 percent a year. Crops with low projected rates of demand growth (less than 5 percent growth) include other rices and maize, which cannot be produced efficiently.

Demand for wheat is projected to grow by less than production, suggesting that wheat imports will decline and production will be determined by how much producers are willing to supply at the import parity price level. In contrast, demand for sugar, which cannot be produced efficiently, is expected to grow by more than 10 percent, suggesting that sugar imports will likely increase in the future.

The World Bank (1995) projects that Pakistan's export market will grow by 6 to 7 percent a year between 1995 and 2005, a rate slightly less than the 1980–90 average and lower than that of some of Pakistan's competitors. The Bank also projects world cotton consumption to grow by 1.9 percent a year through

Table 1.11. *Projected Average Annual Growth Rates for Demand of Selected Commodities, 1993/94 to 2000/2001*
(percent)

<i>Commodity</i>	<i>Moderate growth projection</i>	<i>High growth projection</i>
Wheat	3.6	5.4
Basmati rice	8.0	11.8
Other rice	2.2	3.8
Maize	3.0	5.4
Cotton	7.0	9.4
Sugar	10.0	13.1
Meat	10.2	14.6
Horticulture	8.6	11.9

Note: Moderate growth projections assume 2.5 percent annual population growth and 5.5 percent annual GDP growth. High growth projections assume 3.5 percent annual population growth and 6.5 percent annual GDP growth.

Source: National Commission on Agriculture data.

2005. Domestic consumption in Pakistan should increase by 0.7 percent a year between 1991 and 2005, compared with 0.4 percent annual growth between 1970 and 1990.

Demand prospects for cotton-based manufactures depend on international trade agreements. The recent Uruguay Round Agreements under the General Agreement on Tariffs and Trade calls for a 10-year phase-out of the Multi-Fiber Arrangement, which should provide greater access for Pakistani products, especially to the U.S. and European markets. Because most of the phase-out is concentrated toward the end of the 10-year period, no immediate improvement can be expected, however.

FUTURE CHALLENGES. Future prospects for the agricultural sector depend on its ability to increase output and income of producers. Two direct means of achieving higher output and income are technological change and commercialization. What are the positive effects of technological change and commercialization? If demand for agricultural goods is elastic, technological innovation that increases land productivity can set off a chain of beneficial effects (Binswanger and von Braun 1991). Higher profits will initially accrue to farmers who adopt new technology, and a supply response to higher profits will lead to increased production. Demand for agricultural labor and other inputs will rise, as will demand for marketing and transport services, leading to more employment. Higher levels of consumer spending (as a result of higher profits) will increase demand for domestic goods and labor, and rural wages will rise. Commercialization can also open up new domestic and international markets to small farmers.

The two forces may work in tandem. Developing countries that shifted their crop mix toward marketed and traded crops have shown higher growth in yields per acre in staple food crops. For Pakistan, specializing in labor-intensive crops can create employment and reduce food prices by stimulating the adoption of new technology in staple foods.

But the poor could also lose from technological change and commercialization as farmers are caught on the agricultural treadmill. Because demand for agricultural products is often inelastic, consumers capture most of the gains from technology—that is, as output increases, prices fall because demand does not increase correspondingly. In the extreme, farmers reap none of the gains from technology. Farmers can, however, cushion the impact of technological change by diversifying into other crops. And although they may not gain from innovation as producers, they benefit as consumers through lower food prices. The benefit of falling food prices often outweighs the cost of falling profits and the government can limit price declines by eliminating or reducing export restrictions.

Governments can do little to avoid the constraint of world demand, however. Countries can avoid losses imposed by technological change elsewhere by accelerating their own rate of technological change. If they fail to do so, loss of competitiveness can lead to balance of payments difficulties and depreciation of the exchange rate, which in turn will have negative consequences for the agricultural sector. The loss of income associated with a loss of competitiveness will fall on both consumers and producers.

Constraints on Future Agricultural Growth and the Need for Reforms

The relative productivity of most crops is low and productivity growth has been slow. Past growth relied mainly on expansion of cultivable land, expansion that is no longer possible. Fertilizer use is leveling off, suggesting that returns to further intensification are falling. Productivity growth through technological progress appears to have petered out once the green revolution technology was diffused widely throughout the country. What can be done to revitalize the sector so that it can achieve growth rates that are both satisfactory and sustainable? The answer lies in increased productivity compared to present levels, which will require major changes in systems, policies, and institutions for agriculture over the next three to five years.

Broadly speaking, agriculture faces two sets of constraints in Pakistan: resource constraints and policy distortions. Resource constraints fall into four categories: (a) the inappropriate use of land, causing soil erosion and land degradation, caused partly by inappropriate incentive policy; (b) a pattern of land concentration that does not promote efficiency (many farms are either too large or too small) and the absence

of secure tenure, which creates disincentives for investment in land; (c) a problem-plagued irrigation system; and (d) inadequate human resources and infrastructure.

As for policy constraints, although there has been some improvement, they are still serious. Direct intervention by the government in agricultural markets has diminished in recent years but remains excessive. Subsidization of wheat imports, duty and period restrictions on cotton exports, and protection of sugarcane continue to distort incentives. Nominal protection coefficients reveal a persistent policy bias against cotton and wheat and in favor of sugarcane. Indirect intervention, through protection of industry, penalizes agriculture through the impact on relative sectoral prices. Government policy also affects vital inputs (fertilizers and seeds) and the credit market.

The composition of public expenditure in agriculture is also distorted. Spending is dominated by subsidies that do not help farmers, either because of rent seeking and inefficiencies or because the subsidy is designed to help consumers at the expense of producers.

Growth rates achieved in the past can be sustained and even surpassed if major changes are made in systems and policies. The most important change is a redefinition of the role of government in which the government is limited to ensuring the smooth functioning of markets and promoting private sector activities. Investment and public expenditure in agriculture will have to be reshaped, with government spending focusing on public goods and market failures.

The remaining chapters of this book deal with the major resource and policy constraints currently facing Pakistani agriculture: policy distortions, public enterprises, the land market, irrigation, and rural credit. Other key constraints are examined briefly at the end of this chapter.

Policy Distortions

Massive government involvement in agriculture has done little to benefit farmers in Pakistan. Chapter 2, "Removing Policy Distortions and Redefining the Role of Government" by Faruquee, discusses reform of agricultural policies and institutions and examines how the government can facilitate agricultural growth. The chapter argues that government policy has severely distorted agricultural incentives—directly through agricultural pricing policy and indirectly, until recently, through exchange rate policy.

The effect of price reforms in Pakistan will be determined by producer response. Reforming all policies that impose indirect taxes on agriculture should result in a broader, more substantial response than reform of direct interventions alone. Producers will respond to price reforms that are credible; credibility can be affected by macroeconomic uncertainty, which dampens the response to price reforms because it creates instability in relative incentives. When inflation is high and the real exchange rate overvalued, indirect taxation is high and highly variable. Removing direct price interventions may not lead to a large supply response because of uncertainty and because the impact of nominal price changes on relative prices is difficult to discern.

Although the negative effects of the government's exchange rate policy have been eliminated, the indirect effects from providing heavier trade protection to certain industries linger and input markets remain distorted by subsidies. Those distortions dissipate most of the benefits directed at farmers.

Chapter 2 addresses several key questions on the future role of government in agriculture. Public institutions have proliferated in almost every area of agriculture, with little benefit to the sector. Public enterprises dominate the marketing and distribution of agricultural products, crowding out private sector involvement. The research and extension institutions are particularly weak and the underpricing of electricity and water has entailed hidden expenditures that make the continued provision of those essential inputs financially unsustainable.

For agricultural growth to be sustainable, basic reforms are needed. The proper role of the government should be to encourage the development of a smoothly functioning market through institutional and regulatory reform that facilitates market efficiency and private sector activities. Where market failure is not an issue and government inefficiency is evident, the role of government should be drastically reduced. Government spending should focus on public goods and market failures, not on activities

better suited to the private sector. The government should continue to play an active role in reducing poverty and protecting the environment.

Public Enterprises

The problems of market distortions caused by public enterprises in agriculture are discussed in chapter 3, "Phasing Out Public Enterprises in Agriculture" by Faruquee, Ali, and Choudhry, who argue that public enterprises have not yielded tangible benefits, have inhibited the development of an efficient market in agricultural services, and have been a drain on the budget. They show that the long-run cost of price intervention on agricultural producers has been substantial.

Pakistan's agricultural public enterprises suffer from economic, financial, and managerial deficiencies. From an economic perspective, pursuit of noncommercial goals, noncommercial pricing, and a drive for import protection have led to operating inefficiency, a high cost structure, and inadequate capitalization to meet potential demand. From a financial perspective, low profitability, heavy debt, overreliance on government bailouts, and preferred credit have contributed to a poor return on investment. On the management side, overstaffing and loose control of human resources and inadequate accounting and cost control procedures have led to administrative inefficiency.

Given the poor performance of public enterprises and the distortions created by their intervention in production and marketing activities, what kinds of reforms are needed? Faruquee, Ali, and Choudhry suggest specific institutional and policy reforms. They argue that institutional reforms should focus on divestiture of all commercial activities to the private sector and that only those institutions and functions that support the creation of public goods should continue to be operated by the government. The privatization of viable but large enterprises could take place in stages to allow the private sector to absorb the entities' assets gradually, increase competition, and prevent the growth of private monopolies. To supplement the institutional reform and privatization process, policy reforms should focus on four main issues: macroeconomic policy reform such as eliminating trade barriers and exchange rate controls; price reform; regulatory reform including strengthening the legal environment for business; and financial reform, especially easing government credit restrictions on financial institutions.

Land Markets

The main resource inputs—and constraints—to any country's agriculture are land and water. Farmers require access to these basic natural resources if crops are to be sustainable. Whatever a country's natural endowment, these resources require proper management and protection.

Both equity and productivity can be improved by land reform. Land reform in Taiwan (China), instituted between 1949 and 1953, greatly improved the distribution of income and raised agricultural output. From the outset the government pursued several broad goals (see Fei, Ranis, and Kuo 1979). It sought to strengthen farmers' associations and other components of the organizational and financial infrastructure and to repair physical infrastructure. Farmers' associations, once dominated by landlords and nonfarmers, were reorganized to serve farmers' interests. These associations also began to provide credit and facilities for purchasing, marketing, warehousing, and processing agricultural products.

At the same time, the Taiwan (China) government sought to restructure the agricultural economy by reducing farm rents, selling public lands, and introducing a land-to-the-tiller program. Land rents were reduced by fixing a limit for farm rents and enabling tenants to appeal for a lower rent if crops failed, allowing tenants to pay rents at the end of the period, mandating the registration of written contracts and fixed leases, and giving tenants the option of purchasing land from owners. As a result of these policies prices of farmland dropped. Tenants, who would now benefit by working harder, raised crop yields and increased their incomes. These farmers were then able to purchase the land. With this success the government accelerated land reform by selling public land, giving priority to landless tenants and cultivators of public land. The stage was then set for the most dramatic reform, the compulsory selling of land. The government stipulated that privately owned land in excess of a specified amount had to be

sold to the government, which then resold the land to tenants. This measure gave farmers new incentives to increase production.

As a result of the reforms, the distribution of land holdings changed dramatically between 1952 and 1960. Wealth was substantially redistributed from landlords to new owner-cultivators. The distribution of income also became more equitable. Between 1941 and 1956 the share of property in total agriculture dropped from 63.7 percent to 44.3 percent. The share of farm income going to cultivators rose and that to landowners and moneylenders fell (Fei, Ranis, and Kuo 1979). Important features of Taiwanese experience relevant for Pakistan include imposition of higher taxes for farmers not fully utilizing cultivable land and selling public lands to the landless.

Land resource management in Pakistan leaves much to be desired. Much of the poor quality of the land can be attributed to soil erosion and irrigation-related problems, such as salinity and waterlogging. Imperfections in the agrarian land market and the need for reform are discussed by Mahmood in chapter 4, "Reforming the Agrarian Land Market." Despite attempts at land reform, the agrarian land market in Pakistan remains imperfect and represents one of the important obstacles to increased agricultural output. Mahmood addresses three key questions: what market failures characterize land in Pakistan, how can these market failures be explained, and what kinds of reforms are needed to address these problems? He argues that an efficient land market has failed to develop because property rights to land do not exist in many areas and because the system of land records and registration is obsolete and inefficient. The result is limited access to land and a highly concentrated pattern of landholdings. The inequitable distribution of land resulting from market failures adversely affects agricultural output because the resulting size distribution of farms inhibits agricultural growth.

Given the distribution of landholding size and the rigidities of the land market, would land reform help? Ill-conceived land and tenancy reforms have created a bias against a fixed-rental land market; poor implementation of earlier reforms resulted in little benefit to sitting tenants. Uncompensated land redistribution would be politically unfeasible; compensated land reform would be very expensive and reform would likely be met with widespread evasion.

While the costs and benefits of future land reform should be studied more carefully before further reform is considered, certain actions could be implemented in the short term. These include removing distortions in the machinery and credit markets that have facilitated self-cultivation at the expense of tenants, giving tenants-at-will greater security of tenure, improving the operation of land markets by streamlining the land titling and registration process, and using a land tax to increase the efficiency of land use.

Irrigation

About 90 percent of agricultural output in Pakistan depends entirely on irrigation. Yet Pakistan's irrigation and drainage system is in dire straits. Despite substantial budgetary input, the system suffers from severe and worsening operational problems, including waterlogging and salinity, overexploitation of fresh groundwater, low efficiency in delivery and use, inequitable distribution, unreliable delivery, and insufficient cost recovery.

These problems have many sources. The government treats water as a public good, not a private tradable good for which markets can operate. Lack of well-defined property rights and the illegality of sales of surface water severely constrain informal irrigation water markets. The government has failed to make budgetary provision for operation of the system and maintains separate public bodies for irrigation maintenance and revenue collection. Administrative discipline, which was adequate in the past, has now broken down and the cost of irrigation maintenance has vastly increased.

Unlike on-farm drainage, off-farm drainage is a public good, since it is generally not possible to exclude individuals from the areawide drainage benefit of lowering the water table. Off-farm drainage will have to continue to be supplied by the government. The underlying problem of an inappropriate institutional framework will nevertheless require reforms that will ensure autonomy, transparency, and accountability.

What can be done to improve the irrigation and drainage system and what should be the strategy for institution changes? In chapter 5, "Improving Irrigation and Drainage," Ahmad and Faruquee suggest

that sustained improvement in performance is possible only with market-determined incentives for irrigation and on-farm drainage. A first step is to draw up enforceable property rights to water, without which any attempt to legalize and commercialize water markets would be futile.

Ahmad and Faruquee argue that establishing individual property rights will not be enough and that the move toward commercial water markets will require major institutional changes in the delivery of irrigation and drainage. The best option for the government is to develop user-directed, autonomous, commercially oriented public utilities to ensure operational transparency and cost recovery of all operation and maintenance and future investment expenditures. As the major users of water, farmer organizations will also be vital to any new market-based irrigation system. These groups could be organized immediately to carry out some maintenance, ensure that water is distributed in accordance with property rights, monitor groundwater use, organize on-farm drainage development, and collect delivery and drainage charges. Off-farm drainage, a public good, must continue to be the responsibility of the government. The public sector institutions in drainage need to be reconstituted to provide them with the autonomy needed to pursue broad-based investment and cost recovery.

Rural Credit

Pakistan's credit institutions are not helping to accelerate agricultural growth and reduce poverty. Although the rural sector accounts for more than 70 percent of employment in Pakistan and roughly two-thirds of rural employment is in agriculture, less than a third of rural households receive loans, only 10 percent of which are from institutional sources. In chapter 6, "Improving Rural Finance," Qureshi, Nabi, and Faruquee argue that rural credit markets must be liberalized to improve performance in the rural economy and efficiency in financial institutions.

They suggest reforms in several areas, including policies to stabilize the economy and the replacement of produce and price controls with prudent regulation and supervision. Commercial banks must also operate in a competitive environment and must be free to set interest rates for rural lending that cover their transaction costs. Credit must be made available to support productivity growth for agricultural smallholders and small producers of the rural nonfarm sector, where Pakistan's growth potential lies. The authors highlight the importance of providing credit to women and the rural poor for consumption smoothing and sustainable income-generating activities.

Credit policy should be directed at developing a market-based financial system for rural finance. Because of the market's failure to support disadvantaged groups, however, a special priority program may be needed to direct credit to women, smallholders, and the rural nonfarm sector, including small-scale nonfarm activities, such as livestock, fisheries, forestry and rangelands, and industrial microenterprises.

Subsidizing interest rates is not the way to help marginal borrowers, who can be better served by fixed-cost subsidies and self-selected targeting. Nongovernmental organizations (NGOs) should be encouraged to help. Commercial banks should be encouraged to lend on bases other than the mortgage and passbook system; to experiment with wholesale credit through input suppliers, marketing agents, and NGOs; and to consider lending for such downstream agricultural activities as agroprocessing.

The biggest challenge facing rural finance is the restructuring of cooperatives. The Agricultural Development Bank of Pakistan should undertake a portfolio audit, the result of which will determine whether a major restructuring of its portfolio or a change in ownership is required. To improve rural financing, the system of property rights, title, and default enforcement must also be strengthened.

Other Constraints to Productivity Growth in Agriculture

Human resource constraints, poor rural infrastructure, in particular transport and energy, and the weakness of the research and extension system are other areas that need to be addressed. A brief discussion of these issues follows. However, because of paucity of relevant data, these constraints are not addressed as separate chapters.

HUMAN RESOURCES. Pakistan's overall education levels compare unfavorably with those of other developing countries (table 1.12). Educational spending is low and primary school enrollment is well below expected levels based on per capita income. Large gender differences exist, with women's literacy at just 21 percent (compared with 45 percent for men). Low female literacy is costly because in many East Asian economies educated women who do not enter the labor force are able to educate their children at home. Low literacy and numeracy inhibit agricultural productivity and complicate the task of agricultural support services. Indeed, the lack of education could well be the binding constraint on agricultural productivity over the next 10 to 15 years. Human capital improvements are particularly important to the poor, whose major asset is their labor. Human capital deficiencies lower the return to labor and make it difficult for unskilled laborers to move out of poverty.

Declining investment in education explains a significant part of the stagnation of agricultural productivity since 1975. A study of total factor productivity in Pakistan covering the 1955–85 period revealed the importance of education. Using data from thirty-five districts, Rosegrant and Evenson (1993) found that a 10 percent increase in rural male adult literacy increased total factor productivity by 2.7 percent. In comparison, a 10 percent increase in the area under irrigation was found to increase total factor productivity by 2.4 percent and a 10 percent increase in the share of land under high-yielding varieties increased total factor productivity by just 1.3 percent.

Quality of education is also a major concern. Butt (1985) found that the productivity of farmers with secondary schooling (used as a proxy for quality education) was significantly higher than the productivity of farmers with only primary education. Primary education increased productivity by 7 percent; secondary education was associated with an 11 percent rise in productivity. Education was also positively correlated with fertilizer use.

RURAL INFRASTRUCTURE. Rural investment is an important source of public capital and raises the quality of human capital by facilitating health improvements; rural infrastructure deficiencies represent obstacles to broadly based agricultural growth. Improved infrastructure also facilitates the development of non-farm income-generating opportunities, which are key to poverty alleviation. The poor benefit to the extent that infrastructure lowers the cost of either agricultural inputs or purchased goods. Infrastructure may also expand the labor market and increase the demand for unskilled labor. Good transportation can allow the poor to take advantage of jobs in urban areas.

The transportation network is central to the timely delivery of inputs and outputs, as well as to promoting commercialization. Telecommunications play an important role in commercialization and information dissemination. Energy becomes increasingly important as agriculture becomes more mechanized. Investment in rural areas has been a hallmark of the East Asian success story. The balance between rural and urban public investment in roads, water, and sanitation facilities has been less even in Pakistan than in the Republic of Korea or Thailand.

Table 1.12. Education Levels in Selected Developing Countries, 1994

Country	GNP per capita (1994 U.S. dollars)	Net primary education (percent)	Adult literacy (percent)	Children reaching fourth year of school (percent)
Mexico	4,180	81	92	95
Egypt	720	48	91	99
Indonesia	880	77	97	89
Pakistan	430	35	29	59
China	530	73	82	86
India	350	52	66	61

Source: World Bank (1994c).

Road volume in Pakistan is among the lowest in the world. Less than a third of Pakistan's 45,000 villages have access to wholesale trading centers through the network of all-weather roads and some areas are cut off from the rest of the country throughout the year. Although overall rural road length increased by 70 percent between 1981 and 1991, the roads remain largely inadequate and the road network is in poor condition. More than half of the network is still unpaved and more than two-thirds of the paved arterial roads do not have enough carriageway width for two lanes.

Poorly maintained roads are estimated to increase transport costs by 30 to 40 percent. The distances between villages and marketing and transportation points would not pose a serious problem if roads were of high quality, but the poor state of the rural road network severely inhibits the timely transport of inputs and outputs. Such constraints are likely to be particularly important as Pakistan seeks to improve its position in the high-value foods sector, which includes perishable fruits and vegetables. A study by Vesque (1994) used a multiple regression model on Pakistani household data to show that higher road status (metal paved or rock paved rather than unpaved roads) has a positive influence on the production of two key staples, wheat and rice.

In a careful study of Indian districts Binswanger, Deininger, and Feder (1993) found that a 1 percent increase in road provision led to a 0.2 percent increase in output. Infrastructure provision also had important indirect effects on output: according to the study, a 1 percent increase in road provision produced a 0.8 percent expansion in banking services.

Improved management of Pakistan's ports to facilitate timely transportation of inputs and outputs is also needed, as is rehabilitation of the railway network, which is in steady decline.

Reliable energy supply is vital to the agriculture sector. Tubewells guarantee timely water delivery only if their power source is ensured. The prompt harvesting of crops is particularly important in Pakistan's double-cropping system: losses in wheat yields from late harvesting of cotton are considerable. A more intensive livestock sector and a move toward production of high-value foods will also require greater energy input for cooling milk and preserving perishable crops.

Pakistan faces significant energy supply constraints compared with other developing countries. Converting all forms of energy consumption to kilograms of oil equivalent, energy consumption per capita was 243 kilograms in 1991, well below the South Asian average of 289 kilograms. Electric power cuts affect the rural sector for up to 10 hours a day, forcing rural residents to rely on generators, which are very expensive to operate. Many problems—notably the underpricing of energy and state control—can be traced to Pakistan's energy sector policy, which has led to the reduction of public and private capital formation.

RESEARCH AND EXTENSION. Knowledge is a vital input to agricultural production; the quality of research and extension determines the size of the knowledge base and how widely it is disseminated.

Agricultural research is underfunded in Pakistan, with operational funds particularly scarce. In many provinces the ratio of wage to operational (nonwage) expenditure in agricultural research is 80:20, much higher than the target ratio of 60:40. The effectiveness of research has declined because of lack of material support, effective planning, monitoring, and evaluation of the research program. Researchers lack the proper equipment and journals (notably foreign journals), creating an inadequate research environment. Different research institutes have overlapping responsibilities and duplication of research is common.

Crop management research emphasizes increases in productivity through research on such issues as land preparation, harvesting, and timing and method of application of input. Resource management research focuses on preservation of the natural resource base. For most crops in Pakistan, it is difficult to find good examples of these types of research that have been applied to farmers' fields. Much evidence indicates that key inputs, such as water and fertilizer, are inefficiently used. Crop and resource management research lacks a systems perspective. Specialized research tends to ignore interactions between different crops and different agronomic issues. Important long-term issues, such as necessary natural resource investments, are generally ignored.

Research has failed to increase input efficiency. Outcomes from well-controlled experiments need to be better tailored to farmer conditions. Merely issuing technical packages to large, heterogeneous

groups of farmers is insufficient. Farmers must be given the means to adapt these packages to their own circumstances.

Most studies indicate that farmer inefficiency is caused mainly by lack of knowledge and skills. As emphasis switches from input intensification to input efficiency, improvements in information and skills play a larger role in increasing productivity. Small farmers may find it more expensive to acquire knowledge; public extension can equalize access to new methods.

Many farmers question the usefulness of the elaborate extension system in place for crops. The more than 5,000 village extension workers often lack adequate training; extension workers with higher education and communication skills are likely to be assigned administrative responsibilities. Moreover, the system now succeeds in transferring technology to only a few poorly chosen farmers. Women and small farmers are often ignored and feedback from farmers is poor. Organizational problems are severe (especially lack of accountability) and operational funding for extension workers is low.

Although much effort was made in the 1980s to implement the training and visit (T&V) extension system, the system's centralized, hierarchical approach limits feedback and adaptability to local conditions and the system has had only modest success. Measures of farmer contact did rise and extension services may have had an impact on increasing pesticide use. But Hussain, Byerlee, and Heisey (1994) could find little evidence that the T&V had improved the quality of extension advice. Some of the success of the T&V system can be explained by the poor state of extension service before the system was introduced. By introducing organizational discipline and some additional funding, the T&V system was able to improve the previously deficient extension services. Less clear, however, is whether the system represented the most cost-effective use of resources.

The notion of extension as a top-down supply-driven process needs to be revised. The goal should instead be to create a demand for information among farmers and to satisfy that demand through the efforts of extension workers. The service should concentrate more on participatory problemsolving with farmers at the local level, which will require substantially improving the education levels of farmers and extension workers.

The research-extension linkage is weak in Pakistan. In Punjab the research and extension services collaborate each year in creating a recommended crop package, which is then issued to farmers. Because many farmers are illiterate, however, these packages (issued in the form of a leaflet) are difficult for many farmers to implement. Moreover, issuing an all-embracing technical package represents an overreliance on the recipe approach to delivering extension messages. Restructuring research and extension must be done simultaneously. Crop and resource management research will require greater onsite specificity and decentralization but will be effective only if the extension service delivers site-specific information.

2

Removing Policy Distortions and Redefining the Role of Government

Rashid Faruquee

This chapter describes distortions in agricultural input and output prices, assesses effects of such distortions on growth and poverty, and recommends ways to better redefine the government's tax and expenditure policies and complement private sector participation in agricultural development.

Policy Distortions

Agricultural incentives can be distorted by sector-specific or economywide policies. Sector-specific policies that distort agricultural prices include commodity marketing and taxation. Distortionary economywide policies include trade and commercial policy that favor other sectors and lead to reallocation of resources from agriculture to protected sectors.

Distortions in Agricultural Output Prices

All major crops in Pakistan are covered by a guaranteed minimum price, or support price, program. In theory, the guaranteed minimum price reflects many factors, including domestic and world supply and demand, production costs, availability of competing crops, and intersectoral considerations. When market prices fall below the guaranteed minimum price, government agencies are required to purchase all quantities offered them by farmers at that price. This program has helped stabilize domestic prices for some commodities such as wheat. The program is costly, however, partly because crops are handled inefficiently by the parastatals, which often collude with processors and traders to share the gains from monopolistic market positions.

Price support policies often have unexpected and undesirable consequences. In a study of 15 crops in 37 countries Knudsen and Nash (1990) showed that the domestic price was actually less stable than it would have been had the price support programs not been in place. Krueger, Schiff, and Valdes (1988) showed that domestic prices of export crops were 11 percent lower than international prices in the 18 countries they examined. In Pakistan as well there is an emerging consensus that farmers bear too heavy an indirect tax burden to pay for the price support policies of the government.

Several distortions result from direct commodity marketing and taxation. The export of cotton, for example, is governed by a complicated set of regulations. Export sales must be made at or above the (daily adjusted) minimum export price. A benchmark minimum export price is established and a variable export duty levied on the gap between the minimum export price and the benchmark price. When international cotton prices rise, the variable duty is imposed in order to discourage exports and to provide domestic textile mills with cheap raw materials. In the case of wheat the government keeps domestic farm prices below the border price by subsidizing imports.

Tariffs and quantitative restrictions that protect other sectors affect the real exchange rate, as shown in table 2.1. These figures actually understate the effect of a distorted exchange rate, as shown in box 2.1.

Table 2.1. Average Annual Overvaluation Caused by Trade Policy Distortions, 1972-87
(percent)

Period	Overvaluation
1972-75	25
1976-79	28
1980-83	25
1984-87	21

Source: Hamid, Nabi, and Nasim (1990, table 3.2).

Box 2.1. The Exchange Rate and Agricultural Incentives

Since most agricultural commodities are traded goods, the level of the exchange rate is an important determinant of agricultural incentives. Distortions in the foreign exchange market can be estimated by comparing the actual exchange rate with a purchasing power parity rate or by looking at the black market premium. As Pakistan has liberalized its foreign exchange market on the current account, the divergence between the actual exchange rate and the purchasing power parity exchange rate (or the black market premium) has fallen. Convertibility on the capital account is still restricted, however, and some divergence between the purchasing power parity rate and the actual rate remains.

Protection of only the nontraded sector causes the real exchange rate to appreciate, resulting in lower domestic prices for traded goods. Most recent studies of agricultural incentives now attempt to use an exchange rate that corrects for such distortions. Hamid, Nabi, and Nasim (1990), for example, use a free-trade exchange rate, which is a rough estimate of the rate that would prevail if tariffs, quotas, and other restrictions were replaced by a free-trade regime. More recent studies use an approximation to estimate overvaluation caused by trade policy distortions. Longmire and Debor (1993) estimate the overvaluation at 14 percent in 1990/91; Shabbir (1994) arrives at the same figure for 1992/93.

The formula for estimating overvaluations caused by trade policy distortions is $100 * [(M + T_m) + (X - T_x)] / (M + X) - 1$

where M = value of imports, T_m = import duties and customs - import rebates, X = value of exports, and T_x = export subsidies - export duties.

The use of exchange rate corrections is subject to caution for several reasons. First, trade policy is only one of many influences on the exchange rate. In fact, distortions such as restrictions on trade flows may have led to the rupee being undervalued. Second, continued depreciation of the rupee and ongoing trade reform have made trade regime effects less important in recent years. Nevertheless, given the conclusion of Valdes (1994) that agricultural incentives can deteriorate in the initial stages of a liberalization program, it is important to establish and highlight the scope for improvement in incentives from reform in trade and commercial policy.

Once parity prices (world prices adjusted for transport costs to domestic locations) have been calculated, indicators of protection and transfer out of agriculture can be constructed in the usual way. The nominal rate of protection is the percentage by which the producer price differs from the parity price. The transfer out of agriculture is the difference between the value added in agriculture at actual prices and the value added at parity prices. The impact on output is calculated by applying supply elasticities to the parity prices.

The effect of policy distortions on output prices is shown in table 2.2, which shows that agricultural producers have historically faced large disincentives.

Distortions in Agricultural Input Prices

To counter the adverse effects of declining agricultural output prices as the green revolution progressed, an extensive system of input subsidies was adopted, including subsidies on irrigation water, fertilizer, seed, pesticides, machinery, and electricity. Government policy has created significant distortions in the

Table 2.2. *Nominal Rates of Protection at Official and Free Trade Exchange Rates, 1960–93*
(percent)

<i>Crop</i>	<i>1960–87</i>	<i>1984–87</i>	<i>1991/92</i>	<i>1992/93</i>
Basmati rice	-38 (-60)	-59 (-69)	-49 (-54)	17 (2)
Cotton	-19 (-46)	-14 (-36)	-48 (-54)	-18 (-29)
Irri rice	-29 (39)	10 (-35)	-22 (-30)	30 (14)
Sugarcane	24 (39)	10 (-18)	70 (53)	56 (37)
Wheat	-10 (-42)	-30 (-48)	-31 (-39)	-35 (-43)

Note: Figures for 1991/92 and earlier show protection at both the official exchange rate and the free-trade adjusted exchange rate (in parentheses). The 1992/93 data are at the official exchange rate. The 1991–92 estimates are trend values; locations are Gujranwala (wheat and basmati rice), Multan (cotton), Faisalabad (sugarcane), and Larkana (irri rice).

Source: 1960–87 and 1984–87: Hamid, Nabi, and Nasim (1990); 1991–92: Longmire and Debord (1993); 1992–93: Shabbir (1994).

markets for agricultural inputs, introduced bias in the use of machinery, and distorted rural credit markets. Subsidized credit schemes also exist, and to the extent that it uses imported inputs, agriculture benefits from exchange rate overvaluation.

TRADED INPUTS. Nominal rates of protection can be adjusted to take account of the fact that price and trade policy will make tradable inputs cheaper (or more expensive) than their free-trade prices (the rate of effective protection). In the past fertilizer, pesticides, and machinery were subsidized and a favorable price regime was created for tractors. Since the late 1970s and early 1980s, when Pakistan eliminated subsidies on most tradable inputs, the subsidy effect of traded inputs has diminished; by the early 1990s rates of effective protection differed little from rates of nominal protection (table 2.3).

Pakistan's fertilizer policy imposes substantial hidden costs on farmers, including costs associated with searching for scarce supplies, panic buying, and depressed yields because of uncertainty about fertilizer availability. Phosphates are rarely delivered on time or in sufficient quantities, resulting in an imbalance between nitrogen and phosphate use: although the recommended ratio is close to 1:1 for most crops, the ratio in Pakistan is at best 3:1. Although phosphate imports are late year after year, the government has failed to respond to the problem.

Pakistan's fertilizer pricing policy has also had harmful intersectoral effects because natural gas prices are held below world prices to reduce the price paid by farmers for fertilizer. Such a pricing policy reduces the availability of gas for use in industry; in an energy-deficient country like Pakistan the policy represents an expensive way to offset agricultural pricing policies.

The benefit of a liberalized input market is evident from the extraordinary growth in pesticide use after the subsidy was ended in 1979/80 and entry to the market was liberalized. Indeed, widespread use of pesticide is generally believed to explain the dramatic growth in cotton yields in the 1980s.

Table 2.3. *Nominal and Effective Rates of Protection, 1991/92 Trend Values*
(percent)

<i>Crop</i>	<i>Location</i>	<i>Nominal rate of protection</i>	<i>Effective rate of protection</i>
Wheat	Gujranwala	-39	-46
Basmati rice	Gujranwala	-54	-59
Coarse rice	Larkana	-30	-39
Sugarcane	Faisalabad	53	70
Cotton	Multan	-54	-63

Note: Measures were constructed using free-trade exchange rates.

Source: Longmire and Debord (1993).

Use of improved seed has been constrained by problems of availability, accessibility, and quality. On-farm research has estimated that use of old seed varieties reduces yields by up to 15 percent. As in the case of fertilizer, government policies have introduced distortions in the seed market. Private seed firms must compete with a large public sector producer that prices seeds uneconomically and operates at a loss (see chapter 3). Private seed development is also held back by the absence of breeders' rights and the lack of trademark protection. Enforcement of laws regarding seed quality is also lax and little is being done to develop seeds for fodder crops and high-value food crops.

A study comparing 1985 tractor prices in 16 countries found that tractors were cheapest in Pakistan and Turkey (in U.S. dollars, at exchange rates used in import transactions) (Binswanger, Donavan, and Fabre 1987). The price per horsepower was US\$136 in Pakistan, compared with just over US\$175 in India and Brazil, US\$200 in Indonesia and Sudan, US\$212 in the Arab Republic of Egypt and Mexico, and more than US\$300 in Sub-Saharan Africa. This price advantage partly reflects the fact that tractors are imported into Pakistan as completely knocked-down kits, subject to relatively low import charges (10 percent), and are assembled in a competitive industry in which the mark-up is officially controlled. In addition, Pakistan is able to obtain the kits from international manufacturers (mainly Russia and Polish) at favorable prices. Interest rates on machinery loans remain significantly lower than parity interest rates (up to 33 percent lower in 1996), but unequal access to subsidized credit for machinery purchases has meant that the benefits of low tractor prices have not been widely distributed. Since 1990 tractor prices in Pakistan have risen and are now close to world prices (Longmire and Debord 1993). They remain higher than tractor prices in some other countries, however, where prices are kept artificially high to prevent increases in farm size and displacement of tenants.

Research on Pakistan and elsewhere has shown the labor-displacing effects of mechanization are far greater than the output-enhancing effects. A cheap tractor policy is particularly undesirable for a country with abundant rural labor. Although agriculture cannot absorb the entire rural labor force in Pakistan and some migration is inevitable, government policy should seek to control rural-urban migration so that cities are not overwhelmed by a flood of displaced workers from rural areas (Faruqee and Carey 1996).

Some mechanization of Pakistani agriculture was clearly inevitable. Mechanized power reduces the burden of agricultural labor; when capital intensity is low, as in Pakistan before the green revolution, the productivity gains from mechanization are considerable. The emergence of lucrative work opportunities in Middle Eastern oil markets in the 1970s represented a huge exogenous shock to the Pakistani labor market that decreased the rural labor supply, necessitating labor-saving investments. Moreover, the intensification in input use that followed the green revolution led to a rise in complementary inputs, including machinery.

The rise in mechanization has been rapid in Pakistan (table 2.4). Between 1970 and 1979 the number of tractors per 1,000 hectares grew at 1.5 percent a year, outpacing increases in all other key inputs. Ali and Velasco (1993) used time-series and district data on different cropping systems to estimate production functions for Pakistani agriculture (table 2.5). Their results show that the input elasticities for labor rose between the 1970s and 1980s while the input elasticities for power fell. These results indicate that the marginal productivity of labor increased over time as capital increased in agriculture and that further increments of mechanical power ceased to generate additional output and in fact caused production to decline in most cases. Why did output fail to respond to increased use of mechanical power? During the 1980s rural labor became less abundant and agricultural wages increased dramatically. The elasticity of labor rose as the elasticities of other inputs (fertilizer, seed, pesticide, and water) declined as a result of resource degradation, according to Ali and Velasco. Total factor productivity in the major cropping systems also stagnated or declined in the 1970s and 1980s.

NONTRADED INPUTS. How did the price of nontraded inputs affect the agricultural sector in Pakistan? The combined effects of output and input pricing can be summarized by the producer subsidy equivalent, which measures the subsidy to, or from, producers resulting from price policy (tables 2.6 and 2.7). Important measured subsidies on nontraded inputs include the lack of complete recovery of operations and maintenance costs on the irrigation system and interest rate subsidies on loans. Calculations, however, do

Table 2.4. Annual Trend Rates of Growth in Intensification in the Crop Sector, 1970–79 and 1980–89 (percent)

Input	1970–79	1980–89
Cropping intensity (percent)	1.1	1.1
Fertilizer (kg/hectare)	12.4	6.6
Water (1,000 cubic feet/hectare)	1.9	1.9
Tractor (number/1,000 hectare)	15.1	10.1
Labor (labor days/hectare)	1.3	1.9

Source: Ali and Velasco (1993).

Table 2.5. Input Production Elasticities in the Crop Production Sector, 1970–79 and 1980–89

Cropping system	Labor		Power	
	1970–79	1980–89	1970–79	1980–89
Wheat-cotton	-0.24	1.06	0.55	0.39
Wheat-rice	1.17	1.40	-0.53	-0.24
Wheat-mixed	0.18	1.41	0.78	-0.39
Punjab and Sindh	0.15	0.83	0.64	-0.06

Note: Generalized least squares estimates. Input production elasticities are calculated at mean values. Power includes bullock and mechanical power, although mechanical power is the dominant component in this category.

Source: Ali and Velasco (1993).

Table 2.6. Effective Rates of Protection and Producer Subsidy Equivalents for Major Crops, 1991/92 Trend Values (percent)

Crop	Location	Effective rate of protection ^a	Producer subsidy equivalent ^b
Wheat	Gujranwala	-46	-15
Basmati	Gujranwala	-59	-33
Irri	Larkana	-39	-10
Cotton	Multan	-63	-40
Sugarcane	Faisalabad	70	92

Note: Measures were constructed using free-trade exchange rates.

a. The effective rate of protection is the ratio between the value added (value of output less value of input) measured in domestic prices and the value added measured in border prices.

b. The producer subsidy equivalent (PSE) is calculated as the total transfers to producers as a percentage of the total value (producer price times quantity produced), where total transfers are measured by the value of price supports, input subsidies, land taxes, research and extension benefits, and so on. Typically the value of transfers is negative (causing the PSE to be negative) when price supports are negative (that is, when the domestic output price is set below the import parity price) or when domestic input prices are set higher than their import parity levels. Because the PSEs and effective rates of protection are calculated differently, they are not directly comparable. Their respective orders of magnitude can be used to indicate relative subsidy effects, however.

Source: Longmire and Debord (1993).

not take account of the capital costs of the irrigation system, which some argue were recovered before the mid-1970s, when revenues from farmers exceeded current costs, or defaults on loans. Another study shows that levels of disprotection for export crops have declined moderately in 1992/93, while rice crops now appear to be moderately protected (see table 2.7). Sugarcane remains protected.

Taking all transfers into account significantly reduces the extent of price distortions; by 1991/92 discrimination against agriculture was close to zero, according to Longmire and Debord (1993). Their calculations understate the effect of price distortions, however, because they ignore intrasectoral distortions

Table 2.7. *Producer Subsidy Equivalents for Major Crops, 1992/93*
(percent)

<i>Crop</i>	<i>Producer subsidy equivalent</i>
Wheat	-41
Basmati rice	-11
Irri rice	-3
Cotton	-33
Sugarcane	16

Note: Estimates are at free-trade exchange rate. Producer subsidy is expressed as a percentage of the value of output at domestic prices.

Source: Shabbir (1994).

and intersectoral policy bias that adversely affect the sector. Although aggregate estimates reveal little discrimination against agriculture, overall efficiency in resource allocation is impaired because of significant disprotection for some crops and strong protection for others. Moreover, even as price distortions have diminished, the efficacy of the price and subsidy regime remains in question. Simply using subsidies as compensation for reduced prices begs the question of whether the subsidies are reaching the intended recipients. Considerable evidence suggests that subsidies are not helping farmers, especially small farmers. Canal water, for example, which is priced at about one-fifth of its social price, is not distributed equally because wealthier farmers are able to bribe officials and engage in rent-seeking behavior. Similar abuses occur in public procurement and anecdotal evidence suggests that procurement agents exploit farmers by absorbing most of the difference between the market and support prices when the support price regime is in effect. Panel studies (Haque 1993) suggest that farmers are willing and able to undertake storage, thus reducing the need for public procurement.

Comparison with Other Countries

Given the similarity between agricultural policies in Pakistan and India, some useful insights can be gained from examining the Indian incentive structure. According to Gulati and Pursell (1993), Indian agriculture had an effective protection coefficient of 0.86 between 1980/81 and 1986/87; the effective protection coefficient in manufacturing was 1.34 (measured at official exchange rates) in 1986/87. Taking account of nontraded inputs reduced disprotection of agriculture to close to zero, but the protection of manufacturing relative to agriculture indicates substantial antiagricultural bias.

According to a World Bank report (1993), Pakistan has also protected industry relative to agriculture, at least as revealed by import tax rates (table 2.8). Actual collection rates may be lower than imposed rates and protection may be latent, since some goods may be produced more cheaply domestically than they are abroad. Other indicators also point to substantial protection for industry. Pakistan's three main industrial sectors are chemicals, engineering, and textiles, which receive average effective protection of 24 percent. In addition, the dispersion rate of protection is huge. Within the three industrial subsectors, 70 percent of domestic resources are employed in inefficient sectors and highly protected industries. This diversion of resource to inefficient sectors is at the expense of unprotected sectors, including agriculture.

Historically, the effect on agriculture of protection of other sectors has been high in Pakistan. The effect of trade policy can be quantified by its impact on nominal rates of protection for agriculture (table 2.9). The total effect can be disaggregated into direct and indirect effects. In the early 1980s the indirect effect of trade policies reduced the price received by Pakistani cotton farmers by 35 percent relative to the world price. In contrast, the price received by producers of Chile's primary export crop (grapes) was reduced by only 7 percent relative to the world price. The Chilean case shows that even when measures

Table 2.8. Trade-Weighted Mean All-Inclusive Import Tax Rates, 1989/90 (percent)

<i>Sector</i>	<i>Rate</i>
Agriculture	46.7
Manufacturing	73.8
Consumer goods	92.4
Intermediate goods	71.8
Capital goods	65.5
Economy as a whole	70.1

Source: World Bank (1993).

Table 2.9. Direct, Indirect, and Total Nominal Rates of Protection for Exported Products in Selected Countries, 1980–84 (percent)

<i>Country</i>	<i>Product</i>	<i>Direct</i>	<i>Indirect</i>	<i>Total</i>
Pakistan	Cotton	-7	-35	-42
Egypt	Cotton	-22	-14	-36
Malaysia	Rubber	-18	-10	-28
Chile	Grapes	0	-7	-7

Note: Sectoral, or direct, effects measure the percent by which producer prices diverge from prices at free trade (given the actual exchange rate and degree of industrial protection). Economywide, or indirect, effects take account of the impact of trade and macroeconomic policies on the real exchange rate and the extent of protection afforded to nonagricultural commodities.

Source: Kreuger, Schiff, and Valdes (1988).

of incentives within agriculture reveal protection close to zero, agriculture can still be hurt by protection afforded other sectors.

Levels of disprotection of agriculture are generally low in the high-performing East Asian economies. In the Republic of Korea agriculture is protected. In Malaysia the level of disprotection is low. In Thailand the level of disprotection of agriculture was similar to Pakistan's in the 1960s, but was subsequently reduced, while Pakistan increased the burden on agriculture.

Effect of Distortions on Growth and Poverty

Government policy has caused resources to flow out of the agricultural sector. One estimate of the net effect of these transfers in the mid-1980s is shown in table 2.10, which shows direct transfers and total transfers,

Table 2.10. Transfers from Agriculture Resulting from Output and Input Price Interventions, 1984–87 (billions of rupees, 1985/86 prices)

<i>Category</i>	<i>Direct transfers</i>	<i>Total transfers</i>
Output prices	9.8	21.0
Input prices	-2.6	-5.2
Net transfers	7.2	15.8
Share of agricultural GDP (percent)	6.4	13.6
Share of GDP (percent)	1.6	3.4

Source: Hamid, Nabi, and Nasim (1990).

the latter accounting for the effect of the trade regime on the exchange rate. It is noteworthy that taking all tax and non-tax interventions, agriculturists still pay less to the government than nonagriculturists.

Nonprice transfers of resources into the agriculture sector take place through public investment and support for research and extension and to a much smaller extent through land revenue and usher. Hamid, Nabi, and Nasim (1990) estimated that total transfers into agriculture averaged Rs 9.2 billion (in 1985/86 prices) between 1984 and 1987, leaving an overall net transfer out of agriculture of more than Rs 6.5 billion, about 4 percent of agricultural gross domestic product (GDP).

The most recent estimate of the transfer from agriculture was made by Shabbir (1994), who analyzed the effect on five major crops of output pricing; assistance on fertilizer, credit, electricity, and canal water; public expenditure on research, extension, and education; and taxes. His results indicate that Rs 19 billion was transferred out of agriculture in 1992/93 (Rs 10.9 billion in 1985/86 prices), or just over 6 percent of agricultural GDP—much less than in previous years. His figure is consistent with the conclusion of Haque (1993), who suggested a range of 5 to 8 percent. The actual figure would be even lower if capital costs of irrigation, loan default, and subsidies on agricultural loans were included.

EFFECT ON OUTPUT. Maintaining output prices below parity and subsidizing inputs is a particularly inefficient and inequitable way of transferring resources from agriculture. Deadweight losses occur when domestic prices are set above or below import or export parity levels. In the case of subsidies on wheat imports, for example, economic losses are incurred because the value of wheat purchased on the international market (measured by the consumer price plus the subsidy times the import volume) is greater than the opportunity cost of the resources required to produce the wheat domestically and the value of the imported wheat is greater than its value to society (as measured by what consumers are willing to pay).

The effect of price distortions on output has been significant. Hamid, Nabi, and Nasim (1990) estimated the level of short-run annual lost output at free-trade prices resulting from interventions between 1984 and 1987 at 6 percent a year for irri rice and wheat, 10 percent a year for cotton, and 13 percent a year for basmati rice. These figures may overstate the effect on output, since some of the distortions may have been mitigated or even eliminated since the mid-1980s and exchange rate distortions have been reduced. Moreover, the output-enhancing effects of rents from the irrigation system and essentially free credit (resulting from nonpayment of loans by some farmers) were not taken into account.

Cross-country comparisons highlight the effect of resource transfer on growth. Levels of direct and indirect "taxation" of agriculture (including transfers to other sectors) were typically low in the high-performing Asian economies. The high growth rates in those economies suggest the importance of imposing a reasonable burden on agriculture and of transferring resources away from the sector as efficiently as possible.

EFFECT ON POVERTY. Far from helping the poor, as perhaps intended, policy distortions have had a regressive impact on poverty, arising from the distribution of subsidies, lack of tax instruments, and effect on employment.

To the extent that government policy has reduced agricultural growth, it has made poverty reduction more difficult. Moreover, the distribution of the burden of the resource transfer within the agricultural sector may be regressive because of the uneven distribution of subsidies. Direct taxes, the most effective instrument with which to ensure progressivity of the burden, have not been available to policymakers until recently. Because the marketable surplus of large farmers is larger, pricing policy will have a greater impact on them. They are also more likely to capture subsidies and have access to scarce inputs.

Wheat provides a clear example of the failure of policy to achieve its intended goal. To benefit consumers, the government subsidizes imports of wheat. This subsidy reduces producer wheat prices and holds down production. At the same time, the government releases wheat to millers at subsidized prices. Because the price of flour is determined by the market, consumers pay close to the market-clearing price. Millers, not consumers, capture the gain from subsidized wheat as rent and, not surprisingly, excess milling takes place. Even if the subsidy were passed on to consumers, the overall policy would represent an ineffective

means of helping those in need since all consumers (rich and poor) benefit. A targeted subsidy would help the poor at a much lower cost to the government and with less distortionary impact on the economy.

Policy in Pakistan has tended to promote labor-saving technology by encouraging mechanization, thereby reducing agricultural employment. Estimating the different influences on employment for wheat, Longmire (1990) found that between 1970/71 and 1990/91 net employment rose by 80 million days (table 2.11). Mechanization (tractors and threshers), however, reduced employment by 153 million days. Some of this displacement was clearly warranted by technological developments, but some resulted from policy distortions.

Tax Reform Proposals

Revenue could be generated from agriculture more efficiently while simultaneously advancing other worthwhile goals. Progressive direct taxes, for example, would efficiently raise revenue while increasing equity; a land tax would raise revenue and increase the incentive to use land as efficiently as possible.

The interim government of 1993 introduced reforms to the agricultural income tax and wealth tax. These reforms were endorsed by the Task Force on Agriculture, which submitted its report in February 1994. Under the proposed reform, income tax is a presumptive tax based on the productive capability of land, assessed in terms of produce index units (PIUs) and taxed at the rate of Rs 2 per PIU for holdings of 4,000 to 6,000 PIUs and Rs 3 per PIU for holdings of 6,000 to 8,000 PIUs. Holdings of less than 4,000 PIUs will be exempt from income tax and no taxes will be collected on holdings in excess of 8,000 PIUs. The rate of taxation is thus low, with a maximum tax bill of Rs 10,000, or about US\$350. The 4,000 PIU exemption is high, ranging from 75 to 150 acres, depending on location. This makes the tax base extremely narrow and the revenue yield extremely low (about Rs 50 million). Moreover, the PIUs are based on a decades-old assessment, which is now outdated. Some loopholes also appear to remain under the proposed reform. Once the PIU-based liability has been paid, for example, agricultural income can still be used as a tax shelter. When land functions as a tax shelter, its use tends to become distorted.

Under the reforms a wealth tax will also be imposed. Agricultural land will be valued at Rs 200 per PIU and a basic exemption of Rs 1 million, below which no wealth tax is paid, will apply. Exemptions are also permitted for farm houses, agricultural machinery, farm vehicles, and Rs 100,000 of agricultural land, and agricultural wealth is not added to nonagricultural wealth to determine tax liability. After the base exemption each additional Rs 400,000 of wealth is taxable at a progressive rate ranging from 0.5 percent to 2.4 percent. Like the income base tax, the wealth tax base is narrow and outdated, with high exemptions and low rates.

To prevent promotion of tax shelters, the government must tax all income in the same manner, regardless of source. The size and direction of resource flows between different sectors should not affect individual tax liability. Replacing the current system of inefficient and inequitable resource transfer and

Table 2.11. *Impact of Various Factors on Employment in Wheat Production, 1970/71–90/91*
(cumulative millions of work days)

<i>Factor</i>	<i>Employment effect</i>
Cultivated area	122.2
Cropping intensity	48.6
Irrigated area	26.3
High yield variety area	11.5
Fertilized area	21.3
Tractors	-112.7
Threshers	-40.3
Total jobs	79.8

Source: Longmire (1990).

commodity-specific taxation, with the possible exception of taxes on commodities in which Pakistan has market power (box 2.2), with progressive direct taxes on income, land, or both would be desirable.

Removal of distortions in input markets will increase the revenue-generating capacity of agricultural taxation. Under the current system large farmers pay very low rates for services, thus increasing their gains from subsidies.

The Appropriate Role of the Public Sector and Expansion of the Role of the Private Sector

Both the public and the private sectors have important roles to play in Pakistan's agricultural sector. How should those roles be defined? When is intervention by the government desirable? The nature and extent of government intervention should be dictated by the nature and extent of market failures (public goods, externalities, moral hazard problems, infant industry situations, monopolies) in the agricultural sector.

The clearest examples of public goods in agriculture are most infrastructure, certain types of drainage, education, basic research, and public information. Even in these cases delivery of some services can be contracted out to the private sector, local user groups, or nongovernmental organizations (NGOs).

Externalities present a strong case for government intervention, but not always government ownership. Government regulation or taxation may be necessary to promote optimal use of a product or service. Moral hazard problems arise when the quality of a product cannot be explicitly evaluated, creating incentives for producers to supply substandard quantities. This problem is particularly serious when the substandard product can have harmful side effects, as in the case of pesticides. The government may also need to intervene to regulate market monopolies or oligopolies, or to support infant industries, which economies of scale or a high degree of uncertainty make the private sector reluctant to enter. This argument justifies only a temporary government presence in the industry before the firm can be divested to the private sector.

In some areas the need for government intervention is pressing. The public sector should play a key role in strengthening market institutions and supporting growth-enhancing public goods, mainly in agricultural research, extension, public health, and rural infrastructure. Individual property rights to land must be strengthened so that the market economy can function. Agricultural support services, such as rural credit institutions, water user associations, and farmer organizations, must also be decentralized and supported by the public sector. The government also has an important role to play in correcting environmental externalities associated with forestry, soil conservation, and integrated pest management. Adequate funding is required to maintain basic infrastructure and to provide a framework for generating, developing, adapting, and disseminating appropriate production technologies. In addition, public spending should be directed toward poverty reduction through better rural primary education, health services, and targeted agricultural development programs. Other areas in which the public sector has traditionally intervened, including input marketing, storage, and supply, will have to be turned over to the private sector.

Box 2.2. *The Case for an Optimal Export Tax*

Although export taxes are generally distortionary, a case can be made for taxation of commodities in which a country has market power. Because Pakistan has market power in basmati rice, there is an optimal tariff for this commodity. Protection for other sectors, however, imposes an implicit tariff on basmati rice and there is no way of knowing whether the optimal tariff is greater or less than this implicit tariff.

Experience has shown that the dynamic effects of optimal tariffs can lead to an erosion of market power as other competitors emerge. This is already evident in the basmati rice market, which India and California have now entered. While erosion of market power is partly a result of the mishandling of Pakistani exports by the Rice Export Corporation, it illustrates that the scope for an optimal tariff is less than a static analysis alone would suggest.

Even in legitimate areas government intervention sometimes creates serious problems. Although the government may appear to be intervening to correct a market failure for the public good, intervention may actually be serving private interests, including those of public officials. In areas in which government has no legitimate role, individuals benefiting from intervention become a strong force working to maintain the intervention.

In Pakistan the public sector has extended beyond what normally would have been covered under public goods and market failure. The need is for smaller but better government. A smaller government would reduce the crowding out of the private sector in areas such as input provision and crop marketing. Better government would raise the productivity of the agriculture sector through improved public capital and support services. The continued presence of subsidies and regulations propping up state enterprises slows market development and impedes the transmission of prices to agricultural producers (through corruption in procurement and so on). Scaling down the government's role will require agricultural market liberalization and privatization.

As a percentage of total government spending, spending on agriculture ranged from 3.0 to 8.5 percent in Pakistan between 1984 and 1992, averaging 5.6 percent over the period. This figure is lower than in India (7.2 percent), Indonesia (7.2 percent), and Malaysia (6.8 percent), suggesting that agriculture may be underfunded. Total provincial and federal spending on agriculture decreased in real terms by more than 1 percent a year during the 1982–94 period, during which time current expenditures rose and development expenditures fell (tables 2.12 and 2.13).

Institutions and Services

Public institutions have proliferated in Pakistan and the public sector is involved in the provision of most major services. The activities of public institutions involve input supply, infrastructure provision, regulation, resource mobilization, and output price intervention across federal and provincial levels of government (table 2.14). Public sector intervention in agriculture is overextended, inefficient, and frequently unresponsive to market conditions, especially in the market for input supplies (seed, fertilizer, and so on).

The public presence in input provision has stifled the growth of the private sector, leaving private producers without inputs when they are most needed. It has also contributed to the inefficiency of other agricultural support services: if seed or fertilizer is not available when needed, for example, the impact of public research and extension is diluted.

Subsidies

The largest fiscal outlay made by the government in agriculture has been for subsidies. Current subsidies cover the subsidy on food; development subsidies cover subsidies on fertilizer, seed, and tubewells. Provincial governments have borne a large portion of the current subsidy; development subsidies have been provided exclusively by the federal government.

Between 1984 and 1994 the ratio of current subsidy to current expenditure by the provincial governments ranged from 0.19 to 0.44. The ratio of current subsidies to current expenditure by the federal government ranged from 0.36 to 0.97 (table 2.15). Development subsidies ranged from 0.19 to 0.45 of development expenditure. Although subsidies remain high, they have fallen somewhat in recent years, both in absolute terms and relative to total expenditure (table 2.16).

Current subsidies to support food procurement and price stabilization have insulated consumers from major swings in wheat prices, which varied less than 8 percent from the mean between 1980 and 1995 (Faruquee and Coleman 1996). Procurement represented 24 percent of production between 1970 and 1980, and 31 percent thereafter (Alderman 1993). In comparison, government food procurement in Bangladesh and India has represented less than 10 percent of total annual production.

(Text continues on page 39)

Table 2.12. Public Expenditure on Agriculture (current), 1982/83–1993/94
(millions of constant rupees)

Region, item	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Growth rate
<i>Punjab</i>													
Agriculture	260.2	299.3	306.4	332.0	261.2	383.1	254.1	333.2	344.5	377.9	366.2	378.3	4.13
Irrigation and land reclamation	876.1	949.2	1,039.2	1,101.6	150.5	738.9	973.8	908.5	930.9	1,252.1	1,070.6	1,302.1	4.42
Total	1,340.3	1,505.4	1,615.1	1,756.0	1,872.6	1,512.2	1,598.9	1,579.5	1,632.6	1,990.7	1,804.4	2,047.1	4.79
<i>Sindh</i>													
Agriculture	88.2	122.9	109.1	127.1	134.3	144.5	140.2	157.8	166.8	185.3	156.0	153.6	6.74
Irrigation	264.8	304.2	329.9	353.5	394.8	405.5	411.7	373.9	352.5	355.5	358.9	343.6	2.70
Total	430.8	509.3	529.3	578.3	639.4	658.2	659.1	642.7	650.7	676.3	656.6	637.3	4.36
<i>Northwest Frontier Province</i>													
Agriculture	70.5	85.7	114.4	115.6	120.4	120.8	113.4	106.3	106.8	116.4	122.1	130.1	7.69
Irrigation	94.8	108.6	129.0	147.7	222.0	216.1	245.0	235.9	238.7	237.8	253.1	234.9	13.44
Total	216.5	270.2	306.4	348.7	424.7	426.3	450.9	429.2	447.9	460.0	477.1	475.0	10.85
<i>Baluchistan</i>													
Agriculture	56.6	66.0	73.3	82.1	95.0	104.7	107.8	104.0	100.1	119.3	135.4	143.4	13.93
Irrigation	71.2	65.5	66.4	88.8	84.7	73.4	77.0	68.4	60.0	73.2	73.5	76.1	0.63
Total	167.7	177.4	192.9	228.2	252.0	254.0	254.9	242.4	244.2	287.7	299.2	314.8	7.98
<i>Federal government subsidies</i>	—	—	2,744.0	1,318.0	112.0	358.0	4,751.0	2,501.0	2,229.0	1,914.0	978.0	492.0	—
Wheat and sugar subsidy	—	—	1,039.0	1,318.0	112.0	236.0	3,076.0	1,852.0	1,179.0	1,830.0	978.0	492.0	-0.73
Edible oil subsidy	—	1,179.0	1,704.6	—	—	122.0	1,675.0	649.0	1,050.0	84.3	—	—	-10.00
Total federal current expenditures	145.5	109.5	2,917.0	1,497.6	312.6	413.5	4,919.0	2,670.0	2,393.0	2,085.0	1,196.0	662.4	-0.80
Total national current expenditures	2,300.7	2,571.7	6,708.8	5,906.8	5,337.2	5,542.2	9,092.2	5,563.5	6,343.6	6,320.9	5,310.2	5,099.5	3.26

— Not available.

Note: The considerable fluctuation in certain series from year to year indicates that the data may not always be reliable. The 1993/94 figures are budget projections; actual data may differ markedly. The growth rates of expenditures on federal items are calculated from 1984/85 to 1992/93. All growth rate figures are calculated based on the first and last periods, except the figure for total national expenditure growth, which is calculated using a regression trend line on a two-period moving average series. Other subsectors are not shown individually but are included in the total figures.

Source: Government of Pakistan (1993); Government of Pakistan, *Economic Survey*, 1995.

Table 2.13. Public Expenditure on Agriculture (Development and Total), 1982/83–1993/94
(millions of constant rupees)

Region, item	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Average	Growth rate
<i>Punjab</i>														
Agriculture and credit	215.9	211.8	184.2	225.4	227.0	273.9	124.8	135.6	157.2	138.8	171.3	70.6	187.8	-3.95
Irrigation	424.7	288.3	322.2	272.6	402.5	350.4	182.1	237.1	595.6	545.9	410.6	186.8	366.5	-1.47
Total	785.8	611.9	624.3	601.7	752.1	739.8	398.9	460.8	838.0	762.7	649.5	309.0	656.9	-1.15
<i>Sindh</i>														
Agriculture and credit	88.9	64.4	71.8	76.5	97.7	138.1	78.6	73.6	89.7	50.9	59.2	48.1	80.8	
Irrigation	193.6	172.2	189.7	194.0	284.9	262.3	181.1	255.9	313.0	273.5	238.5	228.3	232.6	2.51
Total	307.7	269.6	298.4	330.6	440.6	458.9	322.9	394.0	490.7	372.6	359.2	324.8	367.7	3.89
<i>Northwest Frontier Province</i>														
Agriculture	40.2	48.1	48.4	47.1	58.8	72.2	90.2	164.7	58.3	142.4	56.6	64.8	75.2	3.41
Irrigation	34.2	50.5	55.5	51.8	64.2	92.4	60.9	105.4	124.5	145.2	189.5	172.0	88.6	29.70
Total	118.9	126.8	128.1	124.5	152.0	192.5	197.5	316.8	227.5	338.9	302.1	311.6	202.3	14.96
<i>Baluchistan</i>														
Agriculture	59.9	53.6	56.6	43.2	56.5	41.0	42.5	41.3	60.2	24.2	41.6	56.2	47.3	-1.26
Irrigation	118.5	122.5	100.8	186.5	156.4	154.6	177.4	166.1	199.4	368.6	415.8	243.5	197.0	15.77
Total	243.7	237.7	221.9	296.6	276.0	240.6	263.5	246.3	280.5	423.0	491.4	360.4	292.8	5.70

(table continues on following page)

(Table 2.13 continued)

Region, item	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	Average	Growth rate
<i>Federal government</i>														
Food and agriculture	1,879.1	1,713.5	1,551.6	2,349.4	1,579.6	1,337.1	1,181.6	1,163.9	809.7	1,130.2	711.7	479.3	1,400.7	-6.08
Irrigation	873.3	894.1	544.9	867.9	1,011.4	608.2	363.7	920.8	775.5	312.1	334.2	507.6	682.4	-4.76
Food storage	219.6	118.8	175.7	47.6	69.8	29.9	3.3	50.9	31.8	5.3	—	—	71.2	-9.09
<i>Federal subsidies</i>														
Fertilizer subsidy	1,623.0	1,220.0	1,137.1	1,766.7	788.8	1,389.2	1,428.7	674.8	678.4	1,224.0	333.3	309.0	1,045.3	-0.96
Tubewell subsidy	2.0	13.3	13.3	11.7	12.6	6.4	4.7	4.4	—	—	—	—		
Total	4,603.7	4,129.9	3,665.1	5,240.4	3,665.2	3,621.5	3,150.0	2,941.2	2,422.0	2,791.1	1,732.0	1,448.2	3,284.2	-2.47
Total national development expenditures	6,062.0	5,389.0	4,951.0	6,605.6	5,298.5	5,259.6	4,337.4	4,363.4	4,258.5	4,688.3	3,534.1	2,754.0	4,977.1	-3.69
Total national agriculture expenditures	8,362.0	7,961.0	11,660.6	12,512.3	10,635.7	10,801.7	13,429.6	9,926.9	10,602.1	11,009.2	8,844.3	7,853.5	10,299.9	-0.57

— Not available.

Note: Growth rates for federal items are calculated from 1984/85 to 1992/93. All growth figures are calculated based on the first and last periods, except the figure for total national expenditure growth, which is calculated using a regression trend line on a two-period moving average series. Other subsectors are not shown individually but are included in the total figures. The last line of this table uses the totals from table 2.12.

Source: Government of Pakistan, *Economic Survey*, 1994.

Table 2.14. *Agricultural Institutions in Pakistan*

Activity/commodity	Federal	Punjab	Northwest Frontier Province	Sindh	Baluchistan
<i>Inputs</i>					
Land	BOR	BOR	BOR	BOR	BOR
Fertilizer	MINFAC (FID)	PAD (PADSC)	PAD (ADA)	PAD (SASO)	PAD NFC/NFML
Seed	MINFAC (FSCD)	PAD (PSC)	PAD (ADA)	PAD (SSC)	PAD
Water	MOW&P/ WAPDA PID	PID	PID	PID	IRSA
On-farm maintenance	MINFAC (FMWC)	PAD (OFWMD)	PAD (OFWMD)	PAD (OFWMD)	PAD (OFWMD)
Minor irrigation	MOW&P	PID	PID	PID	PID
Plant protection	MINFAC (PPPD)	PAD (PADSC)	PAD (ADA)	PAD (SASO)	PAD
Credit	SBD/ADBP/ FBC	PCD (PCDS)	PCD (PCDS)	PCD (PCBS)	PCD (PCBS)
<i>Support services, extension and advanced research</i>					
Agriculture	MINFAC	PAD (PAED)	PAD (PAED)	PAD (PAED)	PAD (PAED)
Forestry	MINFAC	PFD	PFD	PFD	PFD
Livestock	MINFAC	PLD	PLD	PLD	PLD
Fisheries	MINFAC/ MFD	PFD (PFSD)	PFD (PFSD)	PFD (PFSD)	PFD (PFSD)
Machinery	MINFAC	PAD (EngD)	PAD (EngD)	PAD (EngD)	PAD (EngD)
Soil conservation	MINFAC	PAD (SCD)	PAD (SCD)	PAD (SCD)	PAD (SCD)
Research	MINFAC (PARC)	PARB/AUF/ AUP/ SARO/ SAU	BARB/ARIs (AZRI)	ARIs ARIs ARIs	(PCCC)/ KARINA
Economic	PARC (AERU)/ PIDE	PERI/AUF	AEC (PU)	SRPO/AERC (KU)	
Training	MINFAC	ATIs/AUP/ PBAC	ATIs/AUP	ATIs/SAU	AATIs/BAC
<i>Agriculture/livestock</i>					
Forestry	MINFAC (PFI)	FSs/AUF	FSS	FSS	FSS
Irrigation	MIRISPIRI	(IWARSI)/ (DRIP)			
Forestry	MINFAC (PDI)	FSS	FSS	FSS	FSS
<i>Infrastructure</i>					
Electricity	MOW&P/ WAPDA				
FTM roads	MLG&RD	LG&RDD	LG&RDD	LG&RDD	LG&RDD

(table continues on following page)

(Table 2.14 continued)

Activity/commodity	Federal	Punjab	Northwest Frontier Province	Sindh	Baluchistan
<i>Regulation/interventions</i>					
Prices	AFCOM				
Fertilizer	NFDC				
Irrigation	WAPDA	PID	PID	PID	PID
Seed certification	MINFAC (FSCD)				
Electricity	WAPDA				
<i>Quality control food and drug inspectorate</i>					
Environment	PEPA	EPA	EPA	EPA	EPA
<i>Resource mobilization</i>					
Land revenue	Collector	Collector	Collector	Collector	
Ushr	Collector	Collector	Collector	Collector	
Octroi	DC/LBs	DC/LBs	DC/LBs	DC/LBs	
Procurement	PASSCO/ RECP	PDF	PDF	PDF	PDF GOP/CEC

Source: Survey by the author.

Table 2.15. Provincial and Federal Expenditures on Subsidies and Total Expenditures, 1982/83–1996/97
(millions of constant rupees, 1980/81 prices)

<i>Year</i>	<i>Provincial expenditure</i>	<i>Provincial subsidy</i>	<i>Subsidy/ expenditure</i>	<i>Federal expenditure</i>	<i>Federal subsidy</i>	<i>Subsidy/ expenditure</i>
<i>Current expenditures</i>						
1982/83	2,155	—	—	—	—	—
1983/84	2,462	—	—	—	—	—
1984/85	3,792	1,149	0.30	2,917	2,744	0.94
1985/86	4,409	1,498	0.40	1,498	1,318	0.88
1986/87	5,025	1,836	0.37	313	112	0.36
1987/88	5,129	2,278	0.44	535	358	0.67
1988/89	4,173	1,209	0.30	4,919	4,755	0.97
1989/90	2,894	—	—	3,319	3,150	0.94
1990/91	3,950	975	0.25	2,393	2,229	0.93
1991/92	4,236	821	0.19	2,085	1,914	0.92
1992/93	4,114	877	0.21	1,196	978	0.82
1993/94	3,474	963	0.28	540	492	0.91
1994/95	3,713	75	0.02	10,654	106	0.01
1995/96	4,120	52	0.08	12,439	124	0.01
1996/97	3,998	136	0.03	12,004	240	0.02
<i>Development expenditures</i>						
1982/83	1,458	2	0.00	4,604	1,625	0.35
1983/84	1,259	13	0.01	4,130	1,233	0.30
1984/85	1,286	13	0.01	3,665	1,151	0.31
1985/86	1,365	12	0.01	5,240	1,778	0.34
1986/87	1,633	13	0.01	3,665	801	0.22
1987/88	1,638	6	0.00	3,621	1,396	0.38
1988/89	1,187	5	0.00	3,150	1,433	0.45
1989/90	1,422	4	0.00	2,941	652	0.22
1990/91	1,837	0	0.00	2,422	678	0.28
1991/92	1,897	0	0.00	2,791	1,224	0.44
1992/93	1,802	0	0.00	1,732	333	0.19
1993/94	1,306	0	0.00	1,139	309	0.27
1994/95	942	0	0.00	4,720	25	0.01
1995/96	1,021	0	0.00	5,127	4	0.00
1996/97	960	0	0.00	4,890	3	0.00

— Not available.

Source: Tables 2.12 and 2.13. Note that officially reported figures seem implausible for certain years.

Although the government's policy has succeeded in achieving a satisfactory level of food security, public intervention has come at a price. Wheat production has remained depressed because both farmers and traders have been discouraged by low prices. Until recently Pakistan had used the rationing system to maintain low wheat flour prices to urban (as well as some targeted rural) consumers. The rationing system was abolished in 1987, but it was replaced by a program of open-market operation: buying postharvest stock and releasing it later at a predetermined fixed margin over procurement price. Such practices have inhibited the growth of private storage, transportation, and trade in food grain. The government has also controlled international trade of wheat by prohibiting exports and importing irregularly to replenish domestic stocks. Domestic prices of wheat have thus been below import parity prices. Meeting this price differential has been a heavy fiscal drain on the government.

Subsidies have been ineffective for several reasons. Subsidies on such essential factors as fertilizer and seed distort input markets. Government activities in procurement, distribution, and marketing of inputs

Table 2.16. *Food Subsidy and Expenditure, 1982/83–1993/94*
(millions of constant rupees)

Year	Total subsidy	Total current expenditure	Subsidy to current expenditure ratio	Subsidy as a percentage of GDP
1982/83	—	2,301	—	—
1983/84	—	2,572	—	—
1984/85	3,893	6,709	0.58	4.42
1985/86	2,816	5,907	0.48	3.00
1986/87	1,948	5,337	0.37	2.01
1987/88	2,514	5,542	0.45	2.53
1988/89	5,960	9,092	0.66	5.63
1989/90	2,501	5,563	0.45	2.29
1990/91	3,204	6,344	0.51	2.80
1991/92	2,735	6,321	0.43	2.18
1992/93	1,855	5,310	0.35	1.54
1993/94	1,764	5,408	0.33	1.45

— Not available.

Source: Government of Pakistan, *Economic Survey*, 1994.

are almost always inefficient and unresponsive to the needs of buyers. The cost of fertilizer distributed by government agencies in Pakistan has been much higher than the market price, an inefficiency loss that is borne by the public exchequer. Most public seed corporations have also been operating at a loss. Farmers have been deprived of both the benefits of competitively driven prices and active commercial market.

In the short run cheap inputs also encourage waste through overuse, particularly by poor farmers not well versed in agronomy. Fertilizer and seed subsidies are also regressive, because they disproportionately benefit larger farmers, who use large amounts of the subsidized inputs. Administration of the subsidy program also encourages rent seeking.

Other subsidies have outlived their usefulness. A subsidy on seedlings was designed to spur the growth of private forestry. Rapid growth has been achieved but the principal beneficiaries of the subsidy have been large farmers, some of whom have evicted tenants in order to grow block plantations.

A host of indirect subsidies has had a serious impact on fiscal deficits. Qureshi (1993) has shown that most of these indirect subsidies on electricity, water, and credit have added 3.64 to 7.67 percent to the fiscal deficit. Any contribution that these subsidies have made toward assisting poor farmers has been neutralized by poor incentives and distortions. Furthermore, average consumers, the intended beneficiaries of government intervention, have not reaped significant benefits because of leakage and inefficiency in state organizations.

Although explicit subsidies may appear to transfer income to the poorest groups and help the agricultural sector, they distort input and output markets, cause inefficiency, and impose a heavy burden on government finance. Implicit subsidies through pricing policy and transfers to noncompetitive state-owned enterprises cause similar problems and contribute to low investment and farm productivity. The disproportionate share of expenditure that goes toward payroll and establishment costs and the decline in operational expenditure are other signs of inefficiency.

Natural Resource Preservation and Infrastructure Maintenance

While public expenditure has been excessive and ineffective in some areas, it has been inadequate in others. Natural resource degradation arising from waterlogging and salinity has not been addressed adequately. To the extent that waterlogging and salinity have been caused by inadequate drainage, the government can play an important role. Particularly serious is the neglect of operations and maintenance expenditure on the irrigation system, which has deteriorated as a result (see chapter 5).

Rural infrastructure deficiencies have also been widely documented. Road density in the Pakistani Punjab is just half the density in the Indian Punjab. Road maintenance has been seriously neglected, with expenditures of only Rs 1.3 billion in 1990/91, far short of the Rs 8 billion required to maintain the road network properly.

Research

Even where the public sector has a legitimate role to play, it is often inefficient and weak. Nowhere are the weaknesses and inadequacies of public sector institutions more evident than in research and extension. These deficiencies partly explain Pakistan's lower productivity growth compared with that of India. Rosegrant and Evenson (1993) have shown that there was a dramatic decline in total factor productivity growth in Pakistan after 1975, which they attribute to the decline in investment in public research, extension, and literacy.

Agricultural research in Pakistan is poorly coordinated, with both federal and provincial research institutes working on the same issues, often duplicating each other's efforts without much success. Lack of material support and effective planning, monitoring, and program evaluation have caused the effectiveness of agricultural research to decline. Research is underfunded, with operational funds particularly scarce. In many provinces, the ratio of wage to operational nonwage expenditure is 80:20, much higher than the desired ratio of 60:40 (World Bank 1992b). As a result, researchers work within an inadequate research environment, in which equipment and international journals are lacking.

Agricultural research covers two broad areas: plant breeding research and crop and resource management research. Research on plant breeding has been satisfactory, although the lag in getting research findings to farmers is often long. The average age of wheat varieties in Pakistan is about 11 years, compared with about 7 years for all developing countries, reflecting failures in extension and seed marketing. There is much duplication of effort in breeding research, and economies of scale could be realized if some breeding institutes were consolidated.

Crop management research emphasizes increases in productivity through research on such issues as timing and method of application of input (rather than type of input) and land preparation and harvesting. Resource management research focuses on preservation of the natural resource base. For most crops in Pakistan it is difficult to find cases in which the results of crop management research have been applied to farmers' fields, and evidence indicates that key inputs, such as water and fertilizer, are used inefficiently. Crop and resource management research lacks a systems perspective. Specialized research tends to ignore interactions between different crops and different agronomic issues. Key long-term issues, such as necessary natural resource investments, are generally ignored. Research has also failed to increase input efficiency. Outcomes from well-controlled experiments need to be better tailored to farm conditions. Merely issuing technical packages to large, heterogeneous groups of farmers is insufficient. Farmers must be given the means to adapt these packages to their own circumstances.

Agricultural research is universally accepted as a public good that can never be fully privatized. Some aspects of agricultural research could be tradable, however, and the private sector could play a more important role. In the United States, for example, private corporations regularly fund research in public research institute and universities for proprietary end products. The private sector in Pakistan has also recently begun to work with the government to fund research (box 2.3). Even in the United States, however, basic agricultural research is performed largely by the public sector, which, unlike the private sector, is able to invest in high-risk projects with long gestation periods.

Extension Services

As noted in the last chapter, extension has a central role to play in educating farmers. It can also increase equity by ensuring that small farmers, who may find it more expensive to acquire knowledge, have the same access to information on new farming methods as large farmers.

There are questions about the usefulness of the elaborate extension system in place for crops, and most farmers in Pakistan have little faith in the information they receive from their extension agents. As

Box 2.3. Private Sector Funding for Agricultural Research in Pakistan

After investing US\$16 million in its juice extraction plant in northern Punjab, Sunflo, one of the two major citrus juice companies in Pakistan, discovered that the main citrus variety grown in the area has extremely low yields relative to crops grown in Florida and South Africa. It also recognized that the growing season in the region is limited to four months, compared to six to eight months elsewhere in the world. The low yields are largely the result of the lack of micro nutrients; the lack of early and late maturing varieties limits the length of the growing season.

Recognizing that improving yields and increasing the length of the growing season would represent a boon to its business, Sunflo signed a contract with the Department of Horticulture at the University of Agriculture, Faisalabad, in 1995. Under the agreement, Sunflo will invest Rs 20 million in research and extension projects to increase yields and develop new varieties of citrus crops that will extend the length of the growing season.

noted, organizational problems (especially lack of accountability) are severe, and operational funding for extension workers is low. In Northwest Frontier Province (NWFP), for example, the ratio of salaries to operational expenditure fell from 75:25 in 1982/83 to 85:15 in 1992/93. In addition, the salary budget is spread too thinly over extension staff.

Although much effort was made in the 1980s to implement the training and visit (T&V) extension system, the system's centralized hierarchical approach limits feedback and adaptability to local conditions, and the system has had only modest success (see chapter 1). Major reform of the extension service is a top priority. As outlined in chapter 1, the notion of extension as a top-down supply-driven process has to be revised. The goal should instead be to create a demand for information among farmers and to satisfy that demand through the efforts of extension workers. The service should concentrate on participatory problemsolving with farmers at the local level, something that will require substantially improving the education levels of both farmers and extension workers.

Since the 1980s, when the pesticide market was deregulated, the private sector has begun to offer extension services. Demonstration plots, field days, and mass media campaigns by private firms brought widespread awareness about pest control to farmers. As other agricultural inputs are deregulated, private firms will become increasingly involved in extension services.

Collection of Agricultural Data

The agricultural database in Pakistan is poor. The most important data are estimates of crop production and cropped area, which are compiled at the federal level from data collected by the provincial line agencies. In Punjab a Crop Reporting Directorate operates under the Agriculture Department. In Sindh an Agricultural Statistical Coordination Board handles such data. The traditional method of estimating crop production is based on sampling techniques and crop cut trials. After these data are processed, inputs from other associated agencies (such as boards of revenue, input supply agencies, bureaus of statistics, and planning and development departments) are requested to improve the quality of the data.

Because of constraints on staff and operational funding, crop cut and sampling methods have built-in biases that force production figures to be repeatedly revised. Introduction of trial and error methodology and correction of data based on continuous feedback received from other associated agencies is time-consuming. The data on area under various crops reported by the Board of Revenue system are subject to serious time lag problems and the system of harvest inspection has its own biases. The field-level revenue functionary (the *patwari*) charged with updating the harvest inspection record has a broad role, ranging from land recordkeeping to revenue assessment and collection. Where revenues and other monetary and nonmonetary transactions are involved, such public dealing has the potential to affect the quality of agricultural data.

The need to give more attention to this important public sector function is pressing. Alternative approaches and options, including probability sampling frames and spot satellite imagery, need to be explored to strengthen existing institutions.

The Need for Reform

The cost of market intervention in agriculture in Pakistan has been high and evidence suggests that public expenditure has had little impact on augmenting sectoral growth. Therefore, the need for reform is pressing. New priorities for government spending on agriculture must be established, with the government focusing on the provision of public goods, such as irrigation and research, rather than the provision of food subsidies that disproportionately benefit richer farmers. Elimination of all expenditure on food and fertilizer subsidies would allow the government to increase spending on irrigation and research by almost 50 percent and much needed support could be given to groundwater monitoring and regulation, without which the ongoing privatization of salinity and control reclamation project (SCARP) tubewells is likely to be environmentally unsound. Such a reallocation of resources would be budget neutral, because it would require no additional spending and would move agricultural prices closer to market values, remove disincentives facing private enterprises, and boost growth-enhancing activities that fall within the legitimate realm of government actions.

Before proceeding with rapid liberalization and privatization, the government of Pakistan must allow the core policy objectives and issues to be publicly debated. Objectives must be clearly defined in public policy and appropriate legislation must be passed. The private sector must be regulated so that environmental degradation and health hazards are prevented. At the same time, public policy must guard against overregulation and try to create an environment that is conducive to private sector activity.

3

Phasing Out Public Enterprises in Agriculture

Rashid Faruquee, Ridwan Ali, and Yusuf Choudhry

In many developing countries the belief that concurrent growth and distribution is the mandate of the public sector has led governments to make massive investments in public enterprises (box 3.1). In Pakistan the government has sought to direct the market through a host of policies, including control of input and output prices and the regulation of external trade of agricultural output. Its efforts have been hindered by the poor performance of public sector corporations and the distortionary effects of market intervention, which strongly suggest that many of these institutions need to be phased out.

Performance of Agricultural Public Enterprises in Pakistan

Pakistan's nonfinancial agricultural public enterprises have grown tremendously in size and scope since the 1970s.¹ But their performance has been poor and continuous intervention has contributed to inefficiencies, inappropriate investment choices, cost escalation, credit expansion, and the inefficient allocation of resources. Public sector enterprises represent a significant share of total public sector activity in agriculture and any assessment of the public sector's role in that sector must examine their financial and operational performance.

State Manufacturing Enterprises

Agriculture in Pakistan is dominated by public enterprises engaged in the production and distribution of agricultural commodities. The appendix to this chapter describes the origin and mission of several of them. These enterprises are controlled primarily by three ministries, the Ministry of Agriculture and Food, the Ministry of Production, and the Ministry of Commerce. The largest organization in the sector is the National Fertilizer Corporation (NFC), an agency of the Ministry of Production. The NFC started as a government-owned holding company for nine independent enterprises, Hazara Phosphate Fertilizers Limited, Paksaudi Fertilizers Limited, Pakarab Fertilizers Limited, Pakamerican Fertilizers Limited, Lyallpur Fertilizers and Chemicals Limited, Pakchina Fertilizers Limited, National Fertilizer Marketing Limited, the Fertilizer Research and Development Institute, and the NFC Technical Training Center. Pakchina Fertilizers was divested in 1992, leaving the NFC in charge of five fertilizer manufacturing companies, one fertilizer marketing company, and two research, development, and training organizations. As a holding company the NFC is responsible for the operation of all of the companies under it and it secures financing and development funds, manages personnel and training, and undertakes research and development for all of them. The NFC is incorporated as a private limited company, but all of its shares are held by the government.

The NFC maintains a strong position in the fertilizer industry, controlling 50 percent of all nitrogenous fertilizer and 100 percent of all phosphate fertilizer production in Pakistan. It has expanded its

1. For the purpose of analysis we refer here to nonfinancial public enterprises that are owned and controlled by the government, that received their initial investments from the government, that are under the administrative control of a sponsoring ministry, that generally have access to the government budget, and that are used as instruments of government policies within the macroeconomic framework.

Box 3.1. The Rationale for Public Enterprises

Public enterprises have traditionally been established to provide basic infrastructural support for critical areas of development, such as health, nutrition, and public transport, and to control key sectors that affect economic development. Common justifications for total or partial ownership of commercial enterprises by the government have included the following:

- Generating revenue for the government
- Preventing private monopolies
- Providing socially necessary services (at a financial loss if necessary)
- Influencing prices
- Improving access to foreign equity or loans
- Providing market leadership in new ventures.

None of these rationales is tenable today. Even if a public enterprise is profitable, revenue generation through commercial activities falls outside the accepted norms for state involvement if such activities do not produce public goods. Fiscal policies that encourage private sector activities leading to higher tax revenues represent better ways of generating revenues because they reduce investment risks for the government and provide a more conducive environment for private sector efficiency and growth. Of course, preventing private monopolies is a legitimate concern of the government. But the best way of checking private monopoly is not through direct government takeover but through appropriate regulation.

The government's role in providing essential social services (such as public health services) should be limited to provision of public goods only; the cost of private goods that benefit nontargeted groups should be borne by the beneficiaries. Influencing prices in the economy as a way of subsidizing goods and services is economically and socially unjustified; the benefit of lower prices can be extended to low-income groups through direct budgetary support, such as food stamps, without the distortionary effects of price controls.

State sponsorship may facilitate better access to international capital for public enterprises. Because these funds are often misused by such enterprises, however, creation of a liberal environment for investment, which reduces the risk to foreign investors, is a better way of attracting international financing. Underwriting foreign funds through international organizations is another alternative. Government pioneering of new business activities to attract private entrepreneurs is both inappropriate and inefficient for promoting private sector growth. A more justifiable way to stimulate new business development would be to help reduce risk in the system by creating efficient information networks, improved infrastructure, and so forth.

original mandate to include many additional functions, including operating all existing fertilizer production facilities in the public sector, establishing additional fertilizer production facilities in the public sector, and developing fertilizer marketing and distribution facilities.

PHYSICAL PERFORMANCE. Although the NFC's production capacity rose from 342,400 metric tons in 1973 to 1,673,700 metric tons in 1993—an increase of nearly 20 percent per year—actual production varied across enterprises, declining in most facilities (table 3.1).

The total requirement of nitrogenous fertilizer in Pakistan was 1.65 million nutrient tons in 1993/94, of which the NFC provided 0.51 million nutrient tons (31 percent). The phosphate fertilizer requirement was 0.66 million tons in 1993/94, of which the NFC provided 0.10 million tons (15 percent). The balance of nitrogenous fertilizer was produced by companies in the private sector; the balance of phosphate fertilizer was imported by the government's Fertilizer Import Department.

The Pakarab Fertilizer Corporation is the largest NFC entity, producing more than 700,000 tons of calcium ammonium nitrate, nitrophosphate, and urea a year. Between 1988 and 1993 production of nitrophosphate, calcium ammonium nitrate, and urea fell by 1 to 3 percent a year. The Paksaudi Fertilizer Corporation produces over half a million tons of urea a year, or about 35 percent of all the NFC fertilizer output.

Built in 1958 the Pakamerican Fertilizer Corporation is one of the oldest NFC fertilizer plants. Production fell an average of 1 percent a year between 1988 and 1993, when output was 90,000 tons of ammonium sulfate.

Table 3.1. Production by the NFC Subsidiaries, 1988/89–1992/93
(thousand metric tons)

Corporation	Product	Annual capacity	Actual production					Annual change (%)
			1988/89	1989/90	1990/91	1991/92	1992/93	
Pakarab	NP	304.5	330.8	333.3	321.0	309.8	297.3	-2.02
	CAN	450.0	350.6	338.1	318.8	300.0	302.2	-2.76
	Urea	92.4	108.7	114.9	116.0	113.7	102.5	-1.14
Paksaudi	Urea	556.8	585.6	602.2	558.9	562.0	512.8	-2.49
Pakamerican	AS	90.0	98.1	94.6	92.3	92.9	92.9	-1.06
Lyallpur(Faisal)	SSP	18.0	24.0	23.7	23.1	22.2	23.6	-0.31
Lyallpur(Jaran)	SSP	72.0	85.0	85.7	87.0	87.8	90.7	1.33
Hazara	GSSP	90.0	34.0	54.4	65.0	84.0	90.7	33.32
Total		1,673.7	1,616.7	1,646.9	1,582.0	1,572.4	1,512.7	-1.29

Source: National Fertilizer Corporation data.

Lyallpur Fertilizer and Chemicals Company consists of a plant at Faisalabad and a plant at Jaranwala. Both plants manufacture single superphosphate, with production of each plant totaling about 90,000 tons a year. Production at the Faisalabad plant fell between 1988 and 1993; the Jaranwala plant expanded output by about 1 percent a year over the same period.

The Hazara Phosphate Fertilizer Company produced about 90,000 tons of phosphate in 1993.

FINANCIAL PERFORMANCE. The financial performance of the five NFC production companies between 1986 and 1993 is presented in table 3.2.

Table 3.2. Financial Performance of the NFC Subsidiaries, 1986–93 Average
(millions of rupees)

Variable	Pakarab	Paksaudi	Pakamerican	Lyallpur	Hazara
Operating income	1,778.8 (5.49)	1,438.6 (2.94)	157.8 (17.49)	269.5 (13.57)	200.9 (92.82)
Nonoperating income	7.9 (170.67)	49.2 (5.42)	0.4 (7.69)	0.3 (21.67)	0.2 (110.71)
Total income	1,786.7 (5.74)	1,487.8 (3.01)	158.2 (17.46)	269.8 (13.57)	201.1 (92.55)
Operating expense	1,123.2 (5.72)	753.1 (1.08)	174.6 (8.46)	229.8 (12.70)	177.9 (87.40)
Nonoperating expense	114.5 (2.40)	74.9 (-8.89)	12.2 (-14.99)	35.8 (24.68)	24.5 (46.57)
Total expense	1,536.3 (1.90)	828.0 (-0.13)	186.8 (6.55)	265.7 (14.02)	202.4 (80.94)
Fixed cost	148.1 (16.35)	68.6 (21.82)	51.6 (14.18)	29.1 (31.02)	17.0 (97.33)
Profit before tax	250.5 (90.92)	659.8 (7.45)	-28.7 (-21.88)	4.2 (-3.79)	-1.3 (-88.52)
Income tax	144.6	269.5	1.6	2.0	0.6
Net income after tax	105.8 (97.35)	390.3 (1.87)	-30.2 (-20.37)	2.2 (-7.68)	-1.9 (-79.96)

Note: Figures in parentheses represent growth rates.

Source: National Fertilizer Corporation data.

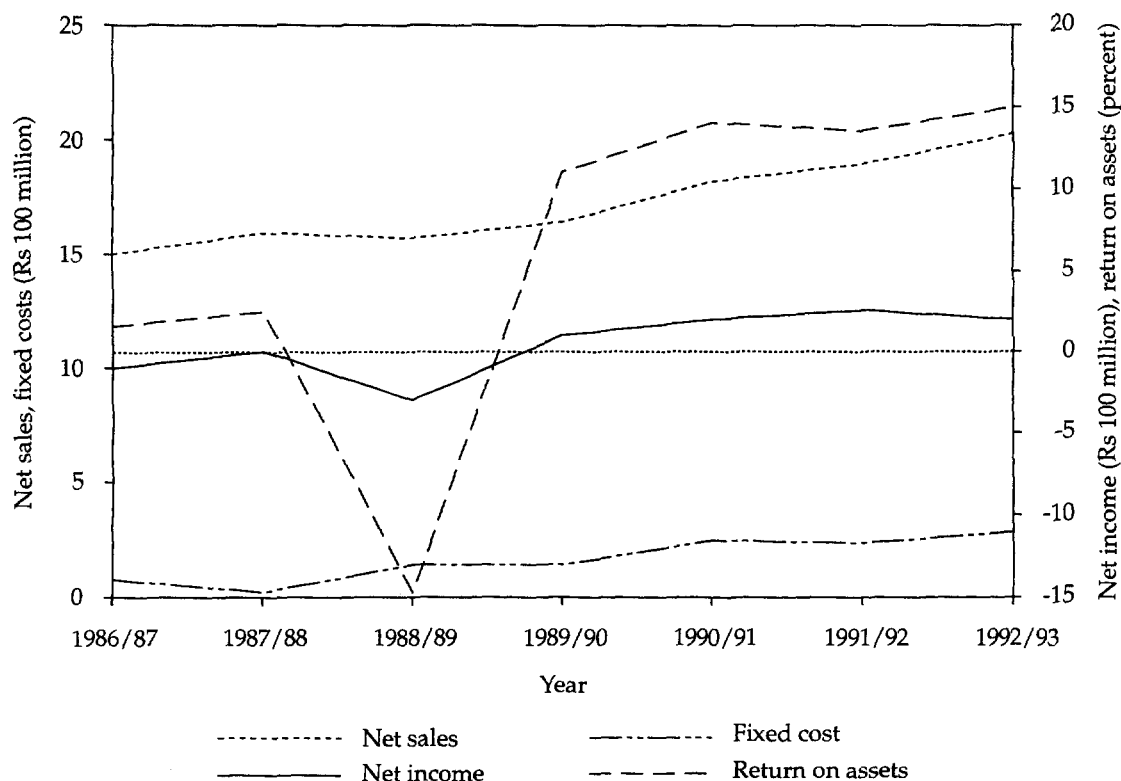
The Pakarab Fertilizer Corporation experienced steady sales growth of 5.5 percent between 1988 and 1993 and the company was profitable in all but one year over the period (figure 3.1). Administrative costs grew by 31 percent, however, and salaries and wages rose by 15 percent a year. With the inclusion of depreciation costs, which declined by 14 percent, overall operating expenditures rose by only about 2 percent, providing the margin for profit. The average growth rate of net income after taxes was 97 percent a year over the 7-year period.

The Paksaudi Fertilizer Corporation was profitable between 1988 and 1993, with average after-tax income of Rs 390 million a year (figure 3.2). Sales grew steadily at 2.7 percent a year, but the cost of sales rose by 11.4 percent, salaries and wages rose by 21 percent, and general administration expenses rose by 24 percent. Increasing operating costs put pressure on net earnings, resulting in after-tax profit growth of only 1.9 percent.

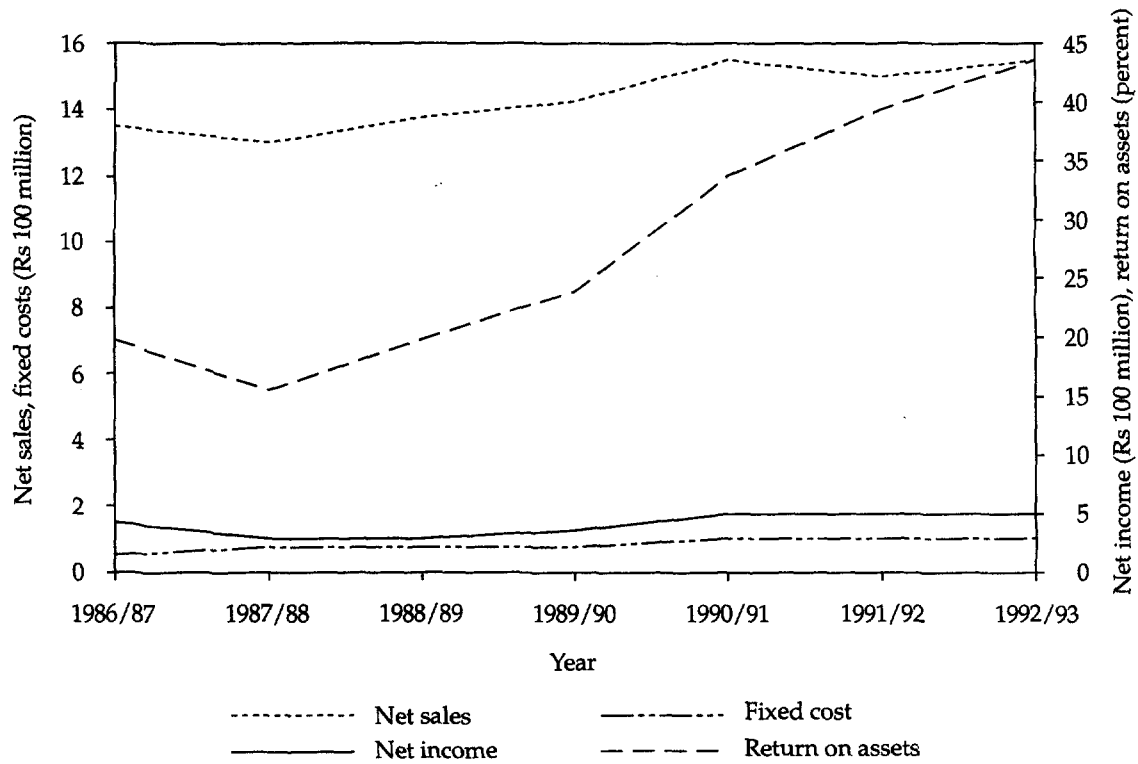
The Pakamerican Fertilizer Corporation incurred losses between 1986/87 and 1992/1993 (figure 3.3), largely as a result of plant inefficiency. The cost of sales was 74 percent of revenue, compared with 36 percent at Paksaudi and 63 percent at Pakarab. Establishment cost represented 33 percent of revenue, far higher than the 4.8 percent of revenue incurred at Paksaudi or the 8.4 percent incurred at Pakarab. In nearly every year the combined variable costs of sales and fixed establishment cost of the corporation were greater than revenue from sales, and the company operated below break-even in five of the seven years between 1986/87 and 1992/93.

Sales at Lyallpur Fertilizer and Chemical grew by an average rate of 13.5 percent a year between 1986/87 and 1992/93 (figure 3.4). Cost of goods sold rose by 10.7 percent, salaries and wages rose by almost 31 percent, and general administrative costs rose by almost 34 percent. Overall operating expenditure increased by 12.7 percent. Net income after taxes was positive in all seven years, averaging Rs 2.2 million, but declined by about 8 percent a year.

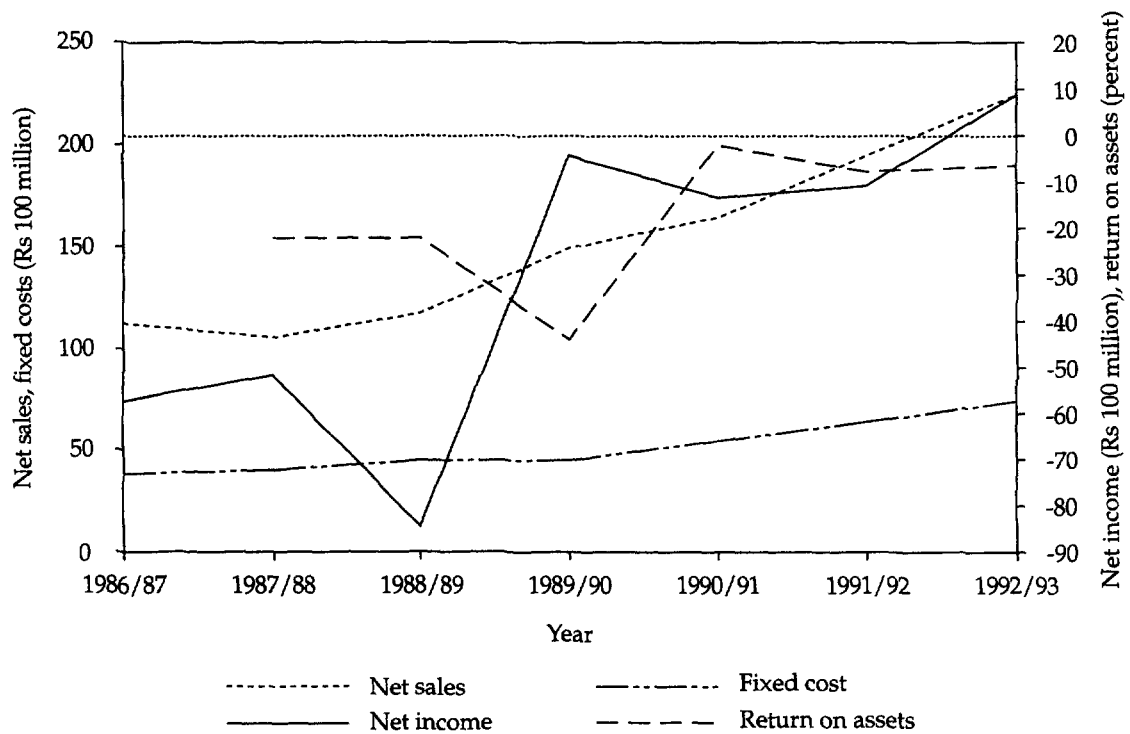
Figure 3.1. Pakarab Fertilizer Corporation: Net Sales and Income Trends, 1986/87–1992/93



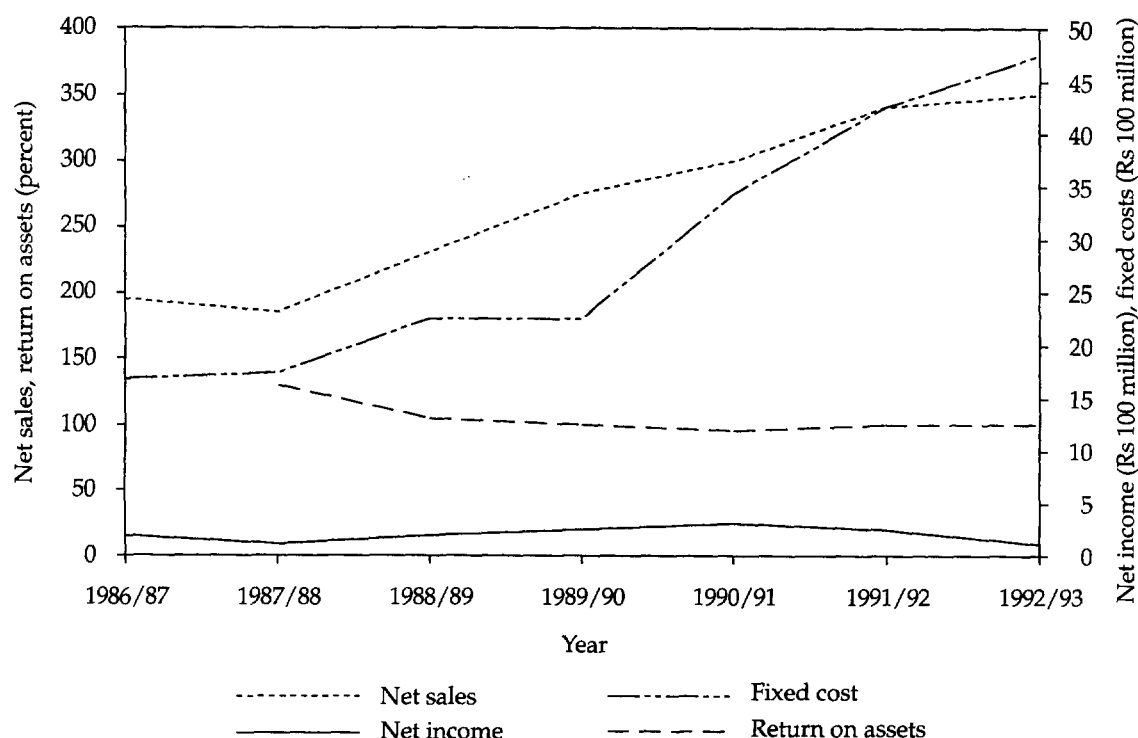
Source: National Fertilizer Corporation records.

Figure 3.2. *Paksaudi Fertilizer Corporation: Net Sales and Income Trends, 1986/87–1992/93*

Source: National Fertilizer Corporation records.

Figure 3.3. *Pakamerican Fertilizer Corporation: Net Sales and Income Trends, 1986/87–1992/93*

Source: National Fertilizer Corporation records.

Figure 3.4. *Lyallpur Fertilizer Corporation: Net Sales and Income Trends, 1986/87–1992/93*

Source: National Fertilizer Corporation records.

Largely as a result of its inability to control costs, Hazara Phosphate Fertilizer Company incurred losses in four out of the six years between 1988/89 and 1992/93 (figure 3.5).

Inclusion of the government subsidy on natural gas on the expense side would have weakened the income statements of all of the production companies, possibly eradicating the profits of the seemingly successful corporations, Paksaudi and Pakarab.

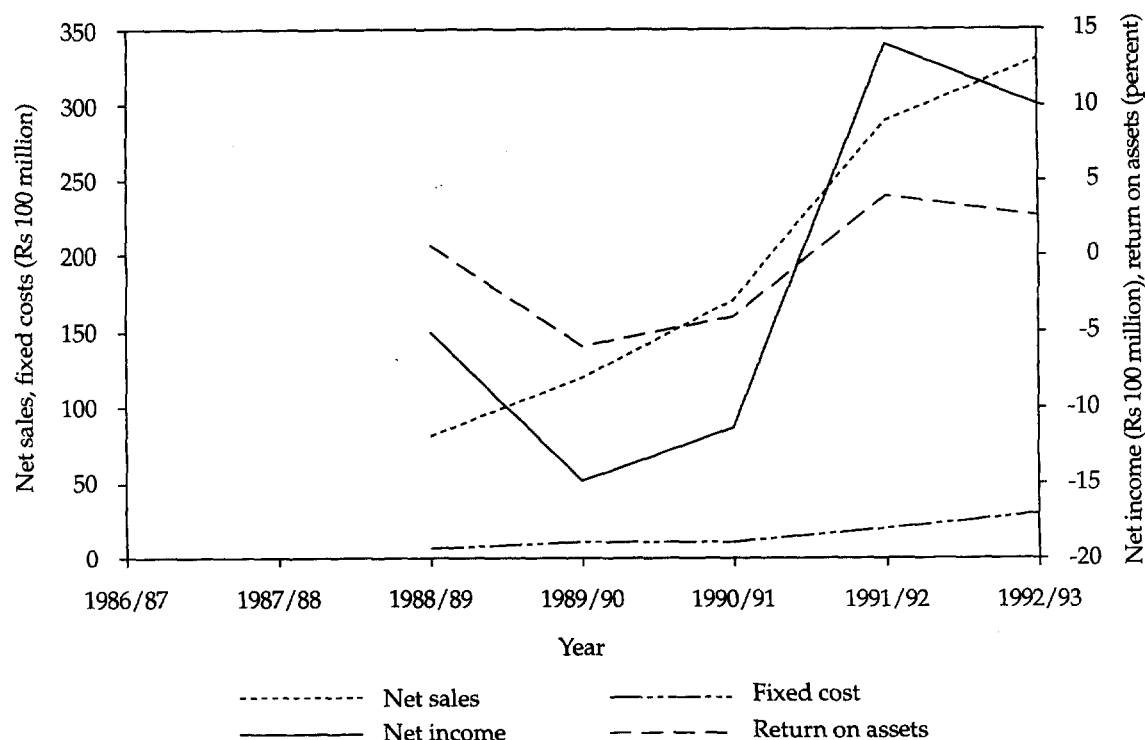
Average financial ratios for the five companies between 1986/87 and 1992/93 are shown in table 3.3. An explanation of the ratios is provided in box 3.2.

Performance of State Marketing Enterprises

Six large public enterprises dominate the input and output markets for agricultural products in Pakistan, as shown in table 3.4.

PHYSICAL PERFORMANCE. The National Fertilizer Marketing Limited (NFML) uses a network of nearly 3,000 dealers to distribute its products to end users; only a small portion of the company's output is sold to distributors and institutional buyers. The company has five main storage points throughout the country and more than 30 temporary storage points in the main consumption areas. Some advisory services on farm management and modern agronomy are provided to farmers, and a quarterly magazine on fertilizer use and several crop and product brochures are published by the company. Mass media are also used to promote the NFC fertilizers. The NFML's performance has been modest: the company met only 86 percent of its distribution target in 1991, 89 percent in 1992, and 91 percent in 1993 (table 3.5). Shortfalls were probably the result of internal inefficiency rather than unexpected natural causes.

Sales of fertilizers by the NFML fell from 1.70 million tons in 1991 to 1.68 million tons in 1992 and 1.53 million tons in 1993. The company's market share declined by 14 percent over the period, reflecting the effect of the liberalization of fertilizer distribution (table 3.6).

Figure 3.5. Hazara Fertilizer Corporation: Net Sales and Income Trends, 1986/87–1992/93

Source: National Fertilizer Corporation records.

Table 3.3. Financial Ratios at the NFC Production Subsidiaries, 1986–93

Ratio	Pakarab	Paksaudi	Pakamerican	Lyallpur	Hazara
<i>Efficiency ratios</i>					
Operating ratio	0.80	0.53	1.18	0.85	0.90
Inventory turnover ratio	2.02	1.78	2.45	4.19	2.96
Total asset turnover	1.01	—	0.70	1.00	0.65
<i>Income ratios</i>					
Return on sales (%)	5.40	27.00	-31.50	0.93	-3.49
Return on equity (%)	10.54	52.00	-69.49	12.95	-1.27
Return on assets (%)	6.42	27.00	-17.82	0.96	-0.77
<i>Creditworthiness ratios</i>					
Current ratio	2.43	2.07	0.77	1.02	1.20
Debt service coverage ratio	3.34	—	-2.90	1.10	1.65

— Not available.

Source: National Fertilizer Corporation data.

The Punjab Seed Corporation (PSC) dominates the seed market, as shown in table 3.7. The company distributes its seeds through the Pakistan Agricultural Development and Supplies Corporation, a network of 600 private dealers, and through about 30 self-owned sales points. It plans to set up production facilities in some remote areas to reduce transportation costs. Five unions represent the company's 600 employees and 400 private laborers. The lower ranks are overstaffed by approximately 25 percent but firing is difficult under existing rules.

The Punjab Agricultural Development and Supplies Corporation (PAD&SC) procures and distributes fertilizer, pesticide, seeds, and agricultural machinery and implements in Punjab. The corporation's

Box. 3.2. Financial Ratios Defined**Efficiency Ratios**

Operating ratio = operating expense/revenue. Measures how much of the operating expenses are balanced by revenue earned.

Inventory turnover ratio = cost of goods sold/inventory. Measures how effectively the organization is managing its inventory assets.

Fixed asset turnover ratio = sales/net fixed assets. Measures utilization of plant and equipment (a low value indicates that the company is not using its fixed assets efficiently).

Total asset turnover ratio = sales/total assets. Measures turnover, or utilization, of all of the firm's assets (a low value indicates that the company is not using its assets efficiently).

Income Ratios

Return on sales ratio = net income/sales. Measures the profit margin on sales.

Return on equity ratio = net income/equity. Measures the rate of return on stockholders' investment.

Return on assets = net income/total assets. Measures the return on total assets.

Creditworthiness Ratios

Current ratio = current assets/current liability. The most commonly used measure of short-term solvency. A rule of thumb is that the current ratio should be about 2.

Debt-equity ratio = debt/equity. Measures the "cushion" with which the organization could absorb losses.

Debt service coverage ratio = (net income + depreciation + interest paid)/(interest paid + repayment of long-term debt). The most comprehensive measure of the organization's creditworthiness.

Table 3.4. Public Marketing Enterprises in Pakistan

<i>Enterprise</i>	<i>Description</i>
National Fertilizer Marketing Limited (NFML)	Subsidiary of the NFC responsible for marketing of fertilizer
Punjab Seed Corporation (PSC)	Provincial enterprise responsible for distributing seeds in Punjab
Punjab Agricultural Development and Sales Corporation (PADSC)	Provincial enterprise responsible for procuring and distributing fertilizer, pesticide, seed, and agricultural machinery and implements in Punjab
Pakistan Agricultural Storage and Services Corporation (PASSCO)	Federal enterprise responsible for procuring major food commodities and implementing the price support program
Rice Export Corporation of Pakistan (RECP)	Federal enterprise responsible for commercial export of rice
Cotton Export Corporation (CEC)	Federal enterprise responsible for exporting cotton

Source: Authors' survey.

fertilizer supplies declined from about 53 percent in the 1970s to about 18 percent in the 1990s. Currently it distributes only phosphate fertilizers, imported exclusively by the government of Pakistan under an assigned quota. The volume of fertilizer handled by the corporation declined between 1974 and 1993 (figure 3.6), and the company's market share has remained insignificant, contributing to the company's high unit operating cost (table 3.8).

Distribution of pesticide fell by more than 80 percent between 1991/92 and 1992/93, largely as a result of the emergence of private firms following liberalization of the pesticide market. Seed distribution is also limited and the company acts as an agent of the Punjab Seed Corporation. Distribution of agricultural machinery and implements has been insignificant.

The Pakistan Agricultural Storage and Services Corporation (PASSCO) is a service organization for implementing the government's food procurement and distribution policy. The company's market share fell from 11.3 percent in 1987/88 to 5.3 percent in 1992/93 (table 3.9).

The Rice Export Corporation of Pakistan (RECP) helped implement the government's price support program by procuring rice from growers at a predetermined price and selling the rice at approved government

Table 3.5. Targeted and Actual Fertilizer Distribution by National Fertilizer Marketing Limited, 1991-93
(metric tons)

Region	1991		1992		1993	
	Target	Actual	Target	Actual	Target	Actual
Hyderabad	139,300	129,501 (93%)	119,150	113,636 (95%)	122,500	107,304 (88%)
Nawabshah	106,280	82,468 (78%)	97,380	83,941 (86%)	96,550	76,561 (79%)
Sukkur	75,400	66,953 (89%)	86,910	71,171 (82%)	87,300	80,527 (92%)
Quetta	22,920	17,497 (76%)	19,420	16,337 (84%)	15,370	15,002 (98%)
Multan	391,200	330,807 (85%)	352,050	317,680 (90%)	296,680	269,408 (91%)
Bhawalpur	255,760	208,003 (81%)	260,500	237,452 (91%)	212,300	192,867 (91%)
Sahiwal	261,750	233,875 (89%)	253,700	233,572 (92%)	212,950	203,018 (95%)
Lahore	209,130	193,681 (93%)	207,200	194,126 (94%)	195,500	178,679 (91%)
Faisalabad	247,540	208,318 (84%)	251,450	194,581 (77%)	217,700	213,131 (98%)
Rawalpindi	65,850	51,321 (78%)	62,540	59,871 (96%)	58,700	49,250 (84%)
Peshawar	184,750	158,963 (86%)	176,200	158,387 (90%)	160,050	146,177 (91%)
Total	1,987,400	1,700,150 (86%)	1,886,500	1,680,754 (89%)	1,675,600	1,531,924 (91%)

Source: National Fertilizer Marketing Corporation data.

Table 3.6. Market Share of National Fertilizer Marketing Limited, 1991-93

Year	Sales (metric tons)	Market share (percent)
1991	1,700,150	53
1992	1,680,754	51
1993	1,531,924	39

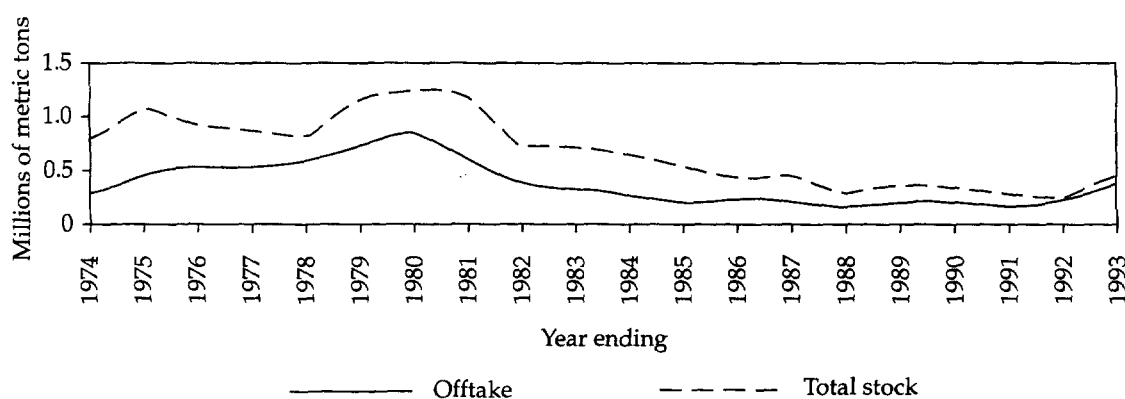
Source: National Fertilizer Marketing Corporation data.

Table 3.7. Pakistan's Conventional Seed Market, 1993
(metric tons unless otherwise specified)

Company	Cotton	Rice	Wheat	Maize	Vegetable	Total
<i>Multinationals</i>						
Pioneer	2,000	100	2,000	—	—	4,100
Cargill	55	50	2,000	—	—	2,105
Sandoz	450	—	—	—	—	450
Lever Brothers	100	—	—	—	—	100
<i>Local companies</i>						
Jallinder	6,400	—	100	10	—	6,510
Zaheer	1,000	—	—	—	—	1,000
Jhandeer	400	—	—	—	—	400
M.Ali	50	—	—	—	—	50
Others	1,450	—	—	—	500	1,950
<i>Public corporations</i>						
Punjab Seed Corporation	4,000	1,600	60,000	1,000	—	76,600
Sindh Seed Corporation	2,000	2,000	6,800	—	—	10,800
Current market total (tons)	27,905	3,750	70,900	1,010	500	104,065
Value (millions of rupees)	252	21	354	5	135	767
Potential market (tons)	67,500	10,437	790,000	10,750	2,000	880,687
Value (millions of rupees)	607	59	3,950	540	54	5,210
Present / potential ratio	41.34	35.93	8.97	9.40	25.00	11.82

— Not available.

Source: ICI Pakistan data, Agriculture and Seed Division.

Figure 3.6. PAD&SC: Fertilizer Handling, 1974–93

Source: PAD&SC data.

Table 3.8. Fertilizer Market Share of the Punjab Agricultural Development and Supplies Corporation, 1988–93

(thousands of metric tons unless otherwise specified)

Year	Province total	PAD&SC	PAD&SC market share (%)
1988	2,611	170	6.51
1989	2,830	220	7.77
1990	—	250	8.31
1991	1,988	200	6.66
1992	1,989	220	7.40
1993	3,365	400	11.88

— Not available.

Source: Punjab Agriculture Development and Supply Corporation data.

Table 3.9. Production Procurement and Market Share of the Pakistan Agricultural Storage and Services Corporation (PASSCO), 1987/88–1992/93

(millions of tons unless otherwise specified)

Year	Production	Procurement	Market share (%)
1987/88	12.67	1.43	11.29
1988/89	14.42	1.08	7.49
1989/90	14.32	1.39	9.71
1990/91	14.57	1.20	8.24
1991/92	15.68	1.19	7.59
1992/93	16.16	0.86	5.32

Source: Government of Pakistan, *Economic Survey*, 1993; corporation records.

prices. Procurement by the company has been declining (table 3.10). The company has done a poor job of maintaining the competitiveness of Pakistan's rice products, and basmati rice—traditionally a strong seller on export markets—has recently been edged out of the international market by packaged Indian basmati.

The Cotton Export Corporation (CEC) held the monopoly for cotton export until 1987, when the private sector was allowed to enter the export business. Internal market demand in Pakistan rose steeply in the 1980s, reducing the availability of raw cotton for export. The government persistently protected the local

Table 3.10. Market Share, Procurement, and Export Volumes of the Rice Export Corporation of Pakistan, 1986/87–1994/95
(millions of tons unless otherwise specified)

Year	National procurement	Procurement	Export	Balance stock	Procurement share (%)	Export growth (%)	Rice export	Export share (%)
1986/87	1,285	—	—	—	—	—	1,270	—
1987/88	834	—	—	—	—	—	1,210	—
1988/89	1,079	503	270	233	46.62	—	849	31.80
1989/90	1,334	546	123	656	40.93	-54.44	744	16.53
1990/91	817	153	353	456	18.73	186.99	1,205	29.29
1991/92	492	120	288	88	24.39	-18.41	1,512	19.05
1992/93	946	—	—	89	0.00	-30.90	1,032	19.28
1993/94	954	—	—	—	—	79.40	1,852	19.50
1994/95	826	—	—	—	—	-45.10	1,015	19.35

— Not available.

Source: Government of Pakistan, *Economic Survey*, various years.

textile industry by setting export quotas, which were reduced drastically in 1993 to 2 million bales following a devastating drought and attack by plant virus. The government imposed additional constraints on CEC and private exporters by ordering them to curtail their export commitments to 0.5 million bales during the November to January shipping period. In November 1993, by which time CEC and private companies had made commitments to international buyers to sell about half a million bales of cotton, the government suspended all exports, throwing the market into disarray. In January 1994 the government completely suspended the export of cotton. The effect of this heavy intervention was a drastic reduction in cotton growers' incomes, which had already been affected by crop damage and low yields. Insulating the market from peak international demand enabled the government to contain price increases to benefit the local textile industry but it had a severe effect on cotton production, which declined rapidly (table 3.11). Cotton exports have fallen since 1986 and CEC's market share has declined from 100 percent in 1987 to 35 percent in 1993/94 as the company lost market share to competition from the private sector (table 3.12).

FINANCIAL PERFORMANCE. As a result of policy reforms introduced in the mid-1980s that liberalized private sector activity, all of the state-owned agricultural enterprises in Pakistan have been steadily

Table 3.11. *Cotton Production, Consumption, and Export, 1986/87–1993/94*

<i>Year</i>	<i>Production</i>	<i>Consumption</i>	<i>Export</i>
1986/87	7,760	3,935	3,861
1987/88	8,633	4,282	2,909
1988/89	8,385	4,765	4,958
1989/90	8,560	5,873	1,831
1990/91	9,628	4,569	1,378
1991/92	12,822	7,396	2,633
1992/93	9,054	8,000	1,541
1993/94	7,600	8,000	500

Source: Cotton Export Corporation data.

Table 3.12. *Market Share and Export Volume by the Cotton Export Corporation, Selected Years*

<i>Year</i>	<i>CEC</i>		<i>Private sector</i>	
	<i>Quantity (millions of bales)</i>	<i>Percent</i>	<i>Quantity (millions of bales)</i>	<i>Percent</i>
1986–87	3.80	100.00	0.00	0.00
1989–90	1.05	58.50	0.80	41.50
1991–92	1.30	49.70	1.33	50.30
1993–94	0.18	35.00	0.32	65.00

Source: Cotton Export Corporation data.

Table 3.13. *Market Shares of Selected Agricultural Public Enterprises, 1983 and 1993
(percent)*

<i>Public enterprise</i>	<i>1983</i>	<i>1993</i>
National Fertilizer Corporation	78.0	50.0
National Fertilizer Marketing Limited	69.0	39.0
Punjab Agricultural Development and Supplies Corporation	5.6	11.9
Pakistan Agricultural Storage and Services Corporation	16.3	7.6
Cotton Export Corporation	100.0	35.0

Source: Information provided by individual companies.

Table 3.14. Profit and Loss of the State Marketing Enterprises
(millions of rupees)

Item	NFML ^a	PSC ^b	PAD&SC ^a	PASSCO ^b	RECP ^b	CEC ^b
Operating income	5,743.80	468.31	920.78	3,660.33	5,210.42	7,479.00
Nonoperating income	26.05	11.02	1.19	15.50	—	122.57
Total income	5,769.85	479.33	921.98	3,675.83	5,210.42	7,601.57
Operating expenses	5,761.34	451.29	929.07	3,356.50	4,534.79	6,364.14
Nonoperating expenses	8.52	14.06	55.90	213.50	758.83	1,658.71
Total expenses	5,769.86	465.35	984.97	3,570.00	5,293.62	8,022.85
Profit before taxes	-0.01	13.98	-62.99	105.83	-83.20	-421.28
Income taxes	13.76	0.75	1.44	28.17	264.22	0.00
Net income (profit) after taxes	-13.77	13.23	-64.43	77.66	-347.42	-421.28

— Not available.

a. 1986-92.

b. 1987-93.

Source: Company accounts.

Table 3.15. Average Financial Ratios and Growth Rates of Pakistan's Public Marketing Enterprises, 1986-93

Ratio	NFML	PSC	PAD&SC	PASSCO	RECP	CEC
<i>Efficiency ratios</i>						
Operating ratio (%)	100.00	97.00	101.00	92.00	89.00	82.00
Inventory turnover	92.53	2.13	2.43	15.72	0.84	6.72
Fixed asset turnover	50.38	0.85	0.66	21.82	10.23	24.94
Total asset turnover	5.97	0.57	0.50	4.89	0.84	2.31
<i>Income ratios</i>						
Return on sales (%)	-0.20	3.47	-7.92	2.12	-10.00	-5.50
Return on equity (%)	-0.52	1.96	—	24.55	—	-113.50
Return on assets (%)	-0.01	1.50	-3.45	11.70	-3.00	-8.51
Basic earning power (%)	-0.01	2.04	-0.39	40.20	13.00	1.83
<i>Creditworthiness ratios</i>						
Current ratio	0.92	2.57	2.01	89.04	1.04	1.07
Debt-equity ratio	86.14	82.18	—	—	—	—
Debt service coverage	-1.50	6.74	-0.08	150.03	1.18	1.68
Times interest earned	1.00	4.12	-0.29	156.06	2.10	1.68
<i>Growth rates</i>						
Sales (%)	0.09	12.68	6.35	-2.21	-14.00	-5.48
Operating expenses (%)	0.09	11.44	6.63	-0.88	-6.00	-7.47
After-tax profit (%)	-34.01	236.00	1.29	-44.00	—	-10.73
Total assets (%)	0.06	41.16	3.08	-57.93	0.68	-8.70

— Not available.

Source: Company statements.

losing market share to the private sector (table 3.13). A summary of key financial indicators of the six marketing enterprises is presented in tables 3.14 and 3.15.

Production enterprises have generally performed better in terms of cost control, operating efficiency, and profits than the trading and distribution agencies (table 3.16). Several factors may explain this phenomenon. First, government equity in the NFC companies rose by 30 percent between 1973 and 1993,

Table 3.16. *Key Average Performance Indicators of Agricultural Public Enterprises, 1986–93*
(millions of rupees and percent)

<i>Enterprise</i>	<i>Pretax profit</i>	<i>Aftertax profit</i>	<i>Annual sales growth</i>	<i>Return on sales</i>	<i>Operating ratio</i>	<i>Debt service coverage</i>	<i>Net worth, 1993</i>	<i>Financial rate of return to equity</i>
NFC	884.00	466.00	26.00 ^a	8.90	85.00	0.99	1,776.00	-1
NFML	-0.01	-13.77	0.09	-0.26	100.22	-1.50	5.24	-18
PSC	13.98	13.23	12.70	3.50	97.00	6.74	800.00	-4
PAD&SC	-63.00	-64.40	6.35	-7.29	101.00	-0.08	0.00	High
PASSCO	105.83	77.66	-2.20	2.10	91.70	150.00	144.00	—
RECP	-83.21	-347.40	-14.00	-10.00	89.00	1.18	—	—
CEC	-421.30	-421.30	-5.50	-5.50	82.00	1.68	390.00	High

Note: All figures except the figure for net worth represent seven-year averages.

a. Overstated because one unit started production in 1988/89 and initial growth was very high. Without this unit annual sales growth was 9.8 percent.

Source: Company statements.

whereas equity in the trading agencies remained unchanged, leaving PAD&SC, PASSCO, RECP, and CEC grossly undercapitalized. PAD&SC, for example, has operated with no equity, financing its operations solely through short-term credit from nationalized banks, something that is possible only because the enterprise is backed by the government. Second, the NFC production units were subject to periodic performance evaluation by the Experts Advisory Cell, a semiautonomous body affiliated with the Ministry of Production. Other state enterprises in the agricultural sector did not undergo any form of performance evaluation and some of them have no audited financial statements for their subsidiaries. (The only financial statements of the Sindh Seed Corporation, for example, are unaudited statements for a single year.) Third, turnover taxes were levied on trading agencies based on their level of activity (procurement and sales), not their level of profits. Trading agencies that consistently incurred losses thus had to pay taxes. In contrast, the NFC production units were taxed on profits, not its sales.

Although losses incurred by trading agencies used for the price support operations are reimbursed by the government, reimbursement is often delayed and in some cases not made at all. Unreimbursed amounts are shown on the balance sheet as receivables. In the extreme case of the PAD&SC, more than 80 percent of the corporation's long-term assets consist of reimbursable losses.

Adverse Effects of the Agricultural Public Enterprise

State intervention in agricultural enterprises crowds out private firms, reduces competition, creates inefficiencies that retard development of the sector, and adversely affects producers. In Africa, farmers were deprived of the right to receive a fair price for their crops by selling them on their own because the marketing enterprises usually set prices below world levels (Knudsen and Nash 1990). In Pakistan (and elsewhere) the government has used public agencies to simultaneously influence and control the market, often paying farmers less than the world price for their crops and simultaneously subsidizing the price of fertilizer, seeds, and other inputs. The inefficiencies associated with public enterprises create shortages and bottlenecks throughout the economy; the pursuit of noncommercial goals—such as promoting regional development, generating employment, and pricing below market to benefit target groups—puts severe pressure on the public budget. Corruption is also a persistent problem in public enterprises.

Most of the agricultural public enterprises in Pakistan are commercially nonviable and their effect on the economy as a whole has been negative. Between 1987 and 1993 the aggregate average yearly loss for the six public marketing enterprises was Rs 755 million, or 18 percent of average current expenditure on agriculture. The public production corporations earned an average annual profit of Rs 466 million during this period, but this figure overstates their actual profitability because all of the corporations received a major

input (natural gas) at a highly subsidized price. Many of these enterprises also excluded other major items, such as the subsidy on government-owned bank loans, interest on direct funds from the government, and occasional state grants, from their accounts. Together the production and marketing corporations incurred average annual losses of Rs 289 million, equal to approximately 7 percent of current agricultural expenditure, a significantly higher figure than in India, Zambia, or Zimbabwe (table 3.17).

Under a system of controlled prices inadequate marketing margins result in inadequate marketing services provided by both public and private marketing channels. Because fertilizer and seed are heavily subsidized, state organizations such as the PSC and PAD&SC have difficulty recouping their full operational costs from consumers. The private sector is also affected, either through administered prices or by the large presence of the government in commercial operations, which causes supply inefficiencies, including inadequate and untimely availability of inputs. Large public enterprises also often suffer from diseconomies as a result of poor management. The cost of inefficient operation is reflected in both the price and the level of service in Pakistan, where private sector prices have tended to be lower than prices of the public enterprises. Recordkeeping is also worse in the public sector because it is not forced to comply with reporting requirements set by regulating agencies.

System Inefficiencies

The inefficiency of Pakistan's agricultural public enterprises can be analyzed in terms of financial inefficiency; technical, or cost, inefficiency; and managerial inefficiency.

FINANCIAL INEFFICIENCY. Public enterprises in Pakistan are generally funded by government equity and debt from nationalized banks. Persistent budget constraints have resulted in inadequate availability of funds for expansion, capital expenditure, and working capital. Because most public enterprises do not generate sufficient funds internally, their free cash flows are usually very low or negative. Commercial loans are usually not available and the only source of funds is federal preferred credit schemes disbursed through nationalized banks. The result of this undercapitalization has been to raise the cost of debt above the cost of equity, further undermining the profitability and creditworthiness of the enterprises. The RECP and PAD&SC have repeatedly defaulted on their bank and government loans; other companies are on the verge of default because of consistent negative cash flows. Only the availability of preferred credits extended by the nationalized banks and the Agricultural Development Bank of Pakistan allow these enterprises to function. Because nationalized banks are owned by the government, the accumulated debt or default is merely transferred from one government department to another, with the state still absorbing the loss.

Table 3.17. *Economic Cost of Public Enterprises in Selected Developing Countries*

Country	Public enterprise	Period	(a)	(b)
			Current expenditure loss/subsidy	GNP/GDP
China	Grains	1988	10.5	2.0
India	Grains	1984-85	4.6	0.5
Gambia, The	Groundnuts	1982-87	10.8	2.8
Mali	Grains	1982-85	8.8	1.3
Zambia	Maize, fertilizer, cotton	1980-86	4.0	3.2
Zimbabwe	All crops	1983-87	5.6	4.6

Note: Figures in column (a) are median government transfers to public enterprises as a percentage of government budget. Figures in column (b) are median government transfers plus the deficit of the organization as a percentage of gross national product (GNP) or gross domestic product (GDP).

Source: Knudsen and Nash (1990).

The negative effects of undercapitalization are reflected in the fact that financial rates of return to equity (adjusted for financing and taxes) for most of Pakistan's agricultural public enterprises are negative: the financial rate of return to all resources engaged ranged between -3 and -2 percent for trading agencies, although it was much higher for the NFC. Given the opportunity cost of capital in Pakistan of more than 10 percent, it is clear that public resources were not put to their best use.

COST INEFFICIENCY. Pakistan's agricultural public enterprises have performed poorly in terms of controlling costs. All of the enterprises use a cost-plus pricing scheme under which retail prices are set on the basis of actual costs incurred plus a margin to cover selling and distribution expenses (called "margin for incidentals" in Pakistan). Cost-plus pricing has eliminated incentives to control cost and explains the absence or inadequacy of internal cost accounting and management information systems. Labor policies that limit the ability of managers to cut administrative and labor costs have also affected efficiency.

MANAGERIAL INEFFICIENCY. Failure to establish specific performance criteria and allow management the freedom to set microeconomic policies, poor compensation relative to the private sector, and lack of skills and training have created managerial inefficiencies and organizational sclerosis known as *x-inefficiency* (Leibenstein 1978). Chief executives have been appointed for political rather than economic reasons and hard budget constraints have not been provided. Budgeting, monitoring, evaluation, and financial controls are modeled after systems used in the public sector, where adherence to procedures rather than accomplishments are used as measures of success. Managers and officials in many agricultural public enterprises and departments are less able than their private sector counterparts, and less prestige is attached to employment in the agricultural sector. Finally, inadequate external control has been exerted over managers: public enterprise evaluation committees are usually staffed by bureaucrats who often belong to the same cadres as the enterprise managers and thus lack incentives for objective evaluation of their charges.

The Effect of Price Intervention

The long-run effect of controlling prices is generally reflected in declining production, as farmers face insufficient incentives to make incremental investments (table 3.18); an increase of smuggling to bordering countries, particularly when the exchange rate is overvalued; and the inhibition of development of marketing and storage services by the private sector (Knudsen and Nash 1990). In Sri Lanka, tea exports declined from 40 percent of the market in 1970 to 19.5 percent of the market in 1991 largely as a result of the heavy export taxes levied in the 1970s and 1980s (World Bank 1994a). In Kenya the share of the world tea market rose from less than 3 percent of the market in the 1970s to more than 9 percent of the market in the early 1990s primarily because of abolition of export taxes in 1988. Mandated uniform pricing throughout

Table 3.18. *Transfers to Producers from Support Prices and State Trading, Selected Years, 1981/82–1992/93*

Year	Transfer (million of rupees)	As a percentage of producer value
1981/82	-7,875	-10
1982/83	-15,190	-19
1983/84	-9,582	-11
1984/85	-11,605	-11
1985/86	-12,209	-9
1986/87	-16,674	-11
1992/93	-19,000	-12

Source: Ender (1992); World Bank (1994d).

the year prevents the private sector from developing storage facilities (because the cost of carrying inventory cannot be recouped), forcing the government to provide this service.

Budgetary Relationship between Public Enterprises and the Government

Most agricultural public enterprises in Pakistan receive direct and indirect financial support from the government. The NFML, for example, has its borrowings underwritten by the NFC and the government. The PSC is partly self-financed and operates partly on credits underwritten by the government of Punjab. The principal lending agencies are Habib Bank, United Bank, and National Bank, all nationalized financial institutions that provide working and long-term finance to the corporation at discounted rates of 9 to 12.5 percent. The PSC has also borrowed working capital directly from the government of Punjab and received Rs 239 million from the Punjab government as an equity grant and Rs 92 million as a long-term loan under an International Development Association refinancing scheme.

PAD&SC finances its operations through bank overdrafts underwritten by the government under counterfinancing facilities against hypothecation of fertilizer stocks. Although the corporation receives no direct subsidy from the government, the guaranteed availability of funds in a credit-restricted market represents a form of indirect subsidy. The company's ability to sustain continued losses between 1985 and 1993 was possible only because of the availability of this credit.

Part of Pakistan's national wheat subsidy of more than Rs 4 billion a year is spent on PASSCO, which is financed directly from the government budget or through credits underwritten by the government. The company's principal commodity, wheat, is sold back to the government at the procurement price plus a handling charge fixed by the government. Any excess expenditure over the handling charge represents a loss for the corporation but there are no impediments to carrying the loss forward. Because the government also reimburses PASSCO for losses incurred on the open market sale of rice, onions, and potatoes, the corporation has no incentive to cut costs. In many ways the enterprise acts as an agent of the government with no financial accountability.

RECP maintains two sets of accounts, one for its own operation as a limited company and another for a government fund used for price support. In 1993 the government provided Rs 11.46 billion in price support. Net sales revenue credited to the fund in 1993 was Rs 2.92 billion, against which Rs 4.26 billion was charged as cost of sales. The net operating loss of 1993 on the fund's account was Rs 1.47 billion. RECP's budgetary relationship with the government is directly related to administration of this fund. Operational profits and losses on this account are placed directly in the national budget, and the corporation's own net gains and losses are linked indirectly to the national budget because it is a fully government-owned institution.

CEC finances its operation from export sales revenues, bank borrowing, and federal subsidies, which increased from Rs 91 million in 1990 to Rs 943 million in 1993. These subsidies reflect a direct government budget liability. An indirect subsidy is also provided through the provision of subsidized guaranteed loans from nationalized banks, and the government's liability extends to the corporation's remaining losses after the subsidy.

Public Enterprise Reform

How can agricultural public enterprises in Pakistan be reformed? Even within the current environment of market liberalization, institutional and political factors have prevented governments from explicitly defining the objectives and scope of public sector activities. The starting point of any reform program must be the recognition of the appropriate role of the government as providing basic infrastructural support and public goods and creating an environment that is conducive to private enterprise development.

To reform the sector, policymakers must acknowledge the principles that farmers have the right to produce whatever they wish, to choose their own technology, and to sell their products freely at home or abroad; that traders have the right to buy and sell goods freely without obstruction from the government

or any other authority; and that consumers have the right to buy products from any source, domestic or international (Knudsen and Nash 1990). Markets work best when individuals are allowed to transact freely: even where exploitation by private firms is suspected, government intervention may prove more costly than market failure. The government should intervene only when externalities prevent individuals from absorbing the full cost or enjoying the full benefit of their actions, that is, it should provide public goods such as infrastructure expansion; regulate and monitor activities that adversely affect the environment, health, and sanitation; and undertake research and development on inputs, outputs, or techniques that cannot be patented.

Where the government seeks to intervene in the market to address issues such as poverty and nutritional intake of the very poor, intervention should be focused and transparent. Providing targeted food subsidies to the underprivileged and income support to very poor farmers is acceptable as long as such programs address the underlying causes of the problems and do not distort price signals. If, for example, the government believes it necessary to stabilize basic food prices in order to provide access to a large segment of the poor population, it should do so through a system of variable border taxes or subsidies rather than through direct procurement and distribution, thus obviating the need to maintain large, inefficient public procurement, storage, and distribution organizations that become a drain on the public budget.

Control of adverse environmental, health, and sanitation effects caused by agriculture requires government intervention through strong regulatory and monitoring measures. Failure to recognize individual property rights has eliminated the incentive to invest in technologies that can limit environmental degradation. To a large extent, the government could induce farmers to be more responsive to environmental, health, and sanitation needs by internalizing their cost through taxation and by providing temporary enabling subsidies that would increase the likelihood of farmer cooperation. Overuse of fertilizers and pesticides could be discouraged through education and discontinuance of artificially low prices.

Sometimes the government may want to fill a gap in the market that is unfilled by the private sector—such as distribution of a product or service to remote or geographically unattractive segments of the market—and may be willing to do so at a loss. Provision of such service by the government could perpetuate the need for a public sector presence by blocking entry of private firms, however, as has happened in the case of fertilizer and seed in many of the remote regions of Pakistan. The government must recognize that some social objectives are beyond its means and that the best long-term solution to some problems lies not in the support of public enterprises but in developing a framework within which viable alternatives will develop, for example, building road and highway networks that link markets to production centers, thus helping to make servicing of remote areas by the private sector profitable.

Cross-Country Experiences with Reform and Lessons for Pakistan

Most countries have pursued one of two routes to public enterprise reform. In some countries public enterprises were privatized and the government simply withdrew from strictly commercial functions. Elsewhere policymakers sought to tighten control over public enterprises in order to make them more efficient in preparation for eventual privatization. With assistance from the World Bank many countries have begun the process of turning over operational control to private firms and maintaining simple supervision over the partly privatized enterprises.

The better option is to privatize commercial public enterprises directly. Privatization gained enormous popularity in the 1980s and nearly 2,500 privatization transactions had taken place among World Bank member countries by the end of 1992 (World Bank 1994b). Chile has sold or transferred about 470 enterprises to the private sector since 1973; Mexico has sold, liquidated, merged, or transferred some 700 enterprises (representing roughly 20 percent of state assets); Jamaica has sold or leased 40 state-owned companies; Guinea and Togo have each sold 15 firms and liquidated many more; Tunisia has sold 40 public enterprises; and the Philippines has sold 29 (Shirley and Nellis 1992). The momentum was initiated by Latin American countries, such as Chile, Mexico, Peru, and Venezuela, but many other countries, including Bolivia, the Arab Republic of Egypt, El Salvador, India, Mozambique, Papua New

Guinea, Sierra Leone, Tanzania, Trinidad, Tunisia, and Uganda, have recently begun to privatize public sector commercial firms.

Other countries have sought to improve the efficiency of public enterprises by overseeing them closely and holding the firms accountable for performance. Advocates of this approach believe that the failure of state enterprises is a result not of a flawed concept but of poor implementation. Despite their best efforts, however, these countries have not been able to improve the operations of their public commercial enterprises, partly because of confusion over objectives that were not achievable simultaneously (attainment of social goals and financial profitability, for example). Although enterprise independence was built into law, enough loopholes were retained for governments to maintain a heavy hand in daily operations. Shortages of staff, professional skills, and time also contributed to the failure of reform of these enterprises (Ramamurti 1991).

Even if governments had been able to improve the performance of public enterprises, this approach to reform would have failed because it seeks to ensure that the enterprises did *things right*, rather than ensuring that it did the *right things*. The duty of the state to provide public goods has been interpreted too loosely, allowing public enterprises to continue crowding out sustainable private sector development.

How successful have countries been in reforming their public enterprises? In countries in which divestiture was implemented after careful planning using competitive processes there is strong evidence of success. In Argentina, for example, privatization backed by macroeconomic liberalization has helped reduce the budget and balance of payments deficits and build credibility with private investors (Alexander and Corti 1993; Thobani 1994). Experience has shown that liberalizing before privatizing prepares private investors to be able to exploit market opportunities fully. Granting private buyers special privileges, such as protection from competition, can only slow the liberalization process and create market distortions.

Evidence of increased efficiency following privatization is difficult to find because the post-privatization experience has not yet been studied extensively. Some evidence—such as the 255 percent increase in outgoing international telephone calls in Jamaica following privatization of the telephone company and the substantial reduction in costs and increase in technological sophistication in the Mexican auto parts industry following divestiture—suggests that privatization has increased firm efficiency (Shirley and Nellis 1992). The social benefits of privatization have also been positive in many countries. A study of 12 privatized firms in Chile, Malaysia, Mexico, and the United Kingdom showed that net welfare of different participant groups (consumers, workers, enterprise owners, competitors, and the government) improved in 11 of the 12 cases (Galal and others 1994).

Privatization has not been achieved painlessly. In some countries, including Benin, Ghana, Mali, and Senegal, privatization has caused loss of jobs; in other countries, including Argentina, Peru, and Tunisia, privatization has caused excessive organizational restructuring. Different methods, including the provision of severance packages and outplacement services to redundant workers, the relocating of personnel to other areas, and the provision of seed capital to help start microenterprises, have been used to mitigate some of these effects.

Unsuccessful privatization has generally been the result of two types of failure: noncompletion or midstream reversal of the process (Type I failure) and completed privatizations that failed to deliver efficiency and fiscal or social benefits (Type II failure). To overcome Type I failure strong program ownership by the government must be established. Avoiding Type II failure depends on placing the process in the proper socioeconomic context and taking all constraining factors into account in planning the sequence of activities. In Turkey privatization was slow as a result of a delay in enacting necessary laws for guiding the process and designing an agency to manage it (World Bank 1994b). In Tanzania privatization was set back by insufficient preparation, institutional and administrative inadequacy, and lack of systematic implementation. Governments must recognize that privatization is not a one-time change but a process that must be strongly and consistently backed by the government.

Undertaking institutional changes without adequate macroeconomic reform can be counterproductive: a policy environment that encourages competition and efficiency pricing by private enterprises

requires antitrust legislation, reduction in import protection, elimination of privileged access to credit and inputs, and deregulation of prices (Berg and Shirley 1987). Without removing price controls in Pakistan, for example, private firms cannot be expected to serve remote areas of the Northwest Frontier Province and Baluchistan. Elimination of import and export barriers, restructuring of the domestic market by removing entry and exit constraints, elimination of public monopoly-monopsony, liberalization of financial markets, and removal of artificial price constraints would facilitate competition in the domestic market, which would lead to greater market efficiency.

Several important lessons for Pakistan emerge from the experiences of other countries (Kikeri, Nellis, and Shirley 1992):

- The primary objective of privatization should be to increase efficiency, not to maximize revenue or distribute ownership widely at the expense of managerial efficiency.
- An appropriate regulatory framework can increase public confidence and support for privatization.
- The more market-friendly a country's policy framework, the easier the privatization process is.
- Rather than restricting markets by excluding foreign investors and favoring certain special groups, the government should try "golden shares" and partial share offerings to win acceptance from international and domestic buyers.
- Rather than investing in public enterprises before privatization, the government should prepare for the sale by implementing legal, managerial, and organizational changes; financial workouts; and labor shedding.
- Providing a social safety net through severance pay, unemployment benefits, retraining, and job search assistance can lessen the pain for displaced workers.
- Providing transparency to the privatization process increases the possibility of its success.

Instituting Reform in Pakistan

Agricultural reform in Pakistan is necessary in two different arenas: government institutions and government policies.

INSTITUTIONAL REFORM. The first step in the process of changing the structure of agricultural public enterprises is analysis of the enterprises in terms of their purpose, scope, and objectives. None of the 11 public enterprises studied appeared to be strategically important in providing public goods, suggesting that all of these firms should be privatized.

The agricultural public enterprises in Pakistan can be analyzed in terms of financial viability and dispensability in the short term (figure 3.7). Financial viability can be defined in terms of the return on assets; dispensability can be defined as the ability to dispose of the organization in the short term without seriously disrupting the market. The size of the market currently served by the enterprises could serve as a measure of dispensability.

The Paksaudi and Pakarab Fertilizer Corporations and the PSC are viable because they operate at a profit. They are also difficult to divest quickly because their market shares are large (more than 15 percent), and it could take time for the government to privatize them. PASSCO and the fertilizer units of the NFC are viable but easy to divest immediately because their market shares are small and the private sector could replace them without difficulty. The NFML, RECP, and CEC are all nonviable but difficult to divest in the short term because their large market shares would necessitate careful planning and require time for implementation. Hazara Phosphate Fertilizer, Pakamerican Fertilizer Corporation, and PAD&SC are all nonviable and divestible enterprises that should be liquidated immediately.

The eventual goal for the government should be to withdraw from the market, either leaving the enterprises under private control or liquidating them if they serve no useful purpose. Privatization could be implemented using several different approaches, depending on the viability and indispensability of the enterprise (see Berg and Shirley 1987; Rueda-Sabater and Levy 1991; and Shirley and Nellis

Figure 3.7. Dispensability and Viability of Agricultural Public Enterprises in Pakistan

		Dispensability	
		Low	High
Viability	High	Paksaudi Fertilizer Corporation Pakarab Fertilizer Corporation Punjab Seed Corporation	Lyallpur Chemical Ltd. Pakistan Agricultural Storage and Services Corporation
	Low	National Fertilizer Marketing Ltd. Rice Export Corporation of Pakistan Cotton Export Corporation	Hazara Phosphate Fertilizer Ltd. Pakamerican Fertilizer Corporation Punjab Agricultural Development and Supplies Corporation

Note: Low viability if five-year average return on assets is negative. High dispensability if market share is below 15 percent.

Source: Authors' assessment.

1992). The government could offer a management contract to a private firm for managing and operating an enterprise that is viable and indispensable; for a firm that is nonviable but indispensable the government could grant a private lease or concession under government management. Both options are generally exercised if the enterprise is considered indispensable, with management contracts initially used for nonprofitable entities and leases (or concessions) used for organizations that are generating profits. Profitable dispensable enterprises are generally divested through privatization of ownership; unprofitable dispensable enterprises are liquidated through the outright sale of assets. The strategy matrix, based on financial viability and dispensability, shown in table 3.19 indicates the best possible scenarios for Pakistan's agricultural public enterprises in the short and long run.

Following these guidelines the government should liquidate the Pakamerican Fertilizer Corporation, the Hazara Fertilizer Corporation, and the PAD&SC; sell off Lyallpur Chemical and PASSCO to the private sector; place the NFMC, RECP, and CEC under management contracts until they become profitable, at which time they should be divested; and lease or offer a concession on the Paksaudi and the Pakarab Fertilizer Corporations and the PSC until they can be divested.

The process of implementing the reforms may be difficult and political opposition is likely. Only sustained efforts, through such actions as designing equitable reform packages, balancing farmers' short-term losses with other benefits, and building public commitment to reform by disseminating

Table 3.19. Strategy Matrix for Divestiture of Agricultural Public Enterprises in Pakistan

Enterprise	Short-term option	Long-term option
Pakarab Fertilizer	Operating lease	Divestiture
Paksaudi Fertilizer	Operating lease	Divestiture
Pakamerican Fertilizer	Liquidation	
Lyallpur Chemical	Divestiture	
Hazara Fertilizer	Liquidation	
NFML	Management contract	Divestiture
Punjab Seed Corporation	Operating lease	Divestiture
PAD&SC	Liquidation	
PASSCO	Divestiture	
RECP	Management contract	Divestiture
CEC	Management contract	Divestiture

Source: Authors' recommendations.

information, providing transparency, and consulting with the affected parties, will allow the momentum of the program to be maintained (Heaver and Israel 1986).

PRO-MARKET POLICY REFORM. The government of Pakistan has moved ahead in recent years to implement many of the necessary macroeconomic reforms needed for providing stable free market conditions for agriculture. Additional reforms are needed, however, to loosen macroeconomic, fiscal, and trade policy constraints; deregulate prices; develop appropriate regulations for protecting businesses and consumers; and facilitate entry and enhanced competition in the financial sectors (see Rueda-Sabater and Levy 1991). Eliminating administrative allocation of imports, exports, and foreign exchange is necessary to provide incentives to new entrants in the market for agriculture inputs and outputs. Keeping the exchange rate from appreciating in real terms would also help allow the market for agricultural trade to develop.

Government efforts to stabilize agriculture commodity prices have been unsuccessful in many countries. Such efforts have also distorted price signals, encouraged underproduction, and subsidized the rich while providing little benefit to the poor. Efficiency pricing requires government withdrawal from state procurement and elimination of price control. Eliminating costly output and input subsidies would remove the disincentives facing both producers and private firms.

The government needs to strengthen those aspects of the regulatory environment that protect business and consumer interests, including legal mechanisms for dispute resolution, enforcement of property rights, elimination of legal monopoly and other market preferences favoring public enterprises, and elimination of entry and exit barriers for private firms. It also needs to strengthen the legal and regulatory mechanisms for preventing anticompetitive behavior and harmful environmental externalities. Transparency of laws and regulations are also necessary for reducing business uncertainties.

Underdeveloped financial markets are one of the greatest obstacles to development of the private sector. Easing of the credit restrictions enforced on private and public banks, increasing lending to microenterprises, and regulating the money and capital markets to prevent fraud, use of inside information, and exploitation of investors could eliminate some of the problems that stymie development of the financial sector.

Appendix: Agricultural Public Enterprises in Pakistan

There are six public enterprises in Pakistan devoted to agriculture:

- The National Fertilizer Marketing Limited
- The Punjab Seed Corporation
- The Punjab Agricultural Development and Supplies Corporation
- The Pakistan Agricultural Storage and Services Corporation
- The Rice Export Corporation of Pakistan
- The Cotton Export Corporation.

The mission of each is described in the following paragraphs.

The National Fertilizer Marketing Limited

The National Fertilizer Marketing Limited (NFML) is a wholly owned subsidiary of the National Fertilizer Corporation (NFC) of Pakistan. Set up as a marketing division of the NFC in July 1976 following the failure of the provincial fertilizer distribution agencies to market the corporation's products, the NFML has 10 regional offices that coordinate the activities of its private dealer network of 2,945 companies. The company was the first to distribute agricultural products nationally and to market indigenous phosphoric fertilizer in Pakistan.

The NFML is responsible for marketing NFC fertilizers and allocating imported fertilizers in the most cost-efficient manner; for organizing distribution and regulating the sale of all products in order to curtail

transportation cost and to ensure maximum sale of each factory's production throughout the country; and for providing technical and agronomic services to farmers for promoting the best use of fertilizers.

The company advises the government on the country's annual fertilizer import requirements by preparing a yearly marketing plan based on total projected demand, expected local production, and the previous year's balance stocks. The operational plan is prepared on the basis of seasonal needs, cropping pattern, and location of fertilizer plant sites.

The Punjab Seed Corporation

The Punjab Seed Corporation (PSC) was established in 1976 as an autonomous public corporation under the Department of Agriculture. Its primary objective at inception was to enhance the province's facilities for production, multiplication, procurement, processing, storage, and marketing of certified seeds. Although private seed companies began entering the market in the mid-1980s, the company's original mandate has remained unchanged.

The Punjab Agricultural Development and Supplies Corporation

Established in 1973, the Punjab Agricultural Development and Supplies Corporation (PAD&SC) is a marketing, distribution, and price control parastatal that serves as an instrument for implementing the Punjab government's agricultural policies. PAD&SC procures, stores, and distributes locally produced and imported fertilizers, gypsum, pesticides, seeds, agricultural machinery and implements, and spares to farmers at the village level; stabilizes fertilizer prices in Punjab; implements the Punjab Fertilizer Control Order of 1973; and compiles statistical data on fertilizer supplies and distribution in Punjab.

The Pakistan Agricultural Storage and Services Corporation

The Pakistan Agricultural Storage and Services Corporation (PASSCO) was established in 1973 as a public limited company fully owned by the federal government and six public sector banks. PASSCO's defined functions include the procurement and supply of wheat, gram, paddy/rice, potatoes, onions, and sunflower seeds under the government support price mechanism, and the construction and operation of warehouses for the storage and disposal of food commodities.

Wheat is procured by PASSCO at the support price fixed by the government and then sold to the provincial authorities of Punjab, Sindh, Baluchistan, Northwest Frontier Province, Azad Jammu and Kashmir (AJK), and the Northern Areas; defense forces; international agencies; and the World Food program. The sale price equals the support price plus a handling mark-up fixed by the government. All other crops procured by PASSCO are sold through open tender, and losses incurred because of the difference between the purchase price and the sale price are reimbursed by the government (except on gram).

The Rice Export Corporation of Pakistan

The Rice Export Corporation of Pakistan (RECP) is a federal government agency in the Ministry of Commerce. Established in 1974 under the Companies Act, RECP is a management contract company that administers a set of assets on behalf of the government of Pakistan. Its mandate is to implement the government's support price system for rice and to export rice on behalf of the government. RECP has two subsidiaries, the Pakistan National Produce Company Limited and Doaba Rice Mills Limited, both of which were privatized in 1993.

RECP procures rice directly from growers and intermediate agents with financing from nationalized commercial banks, which act as paying agents for RECP. Marketing is done through international open tenders.

The Cotton Export Corporation

The Cotton Export Corporation (CEC) was established in 1973 as a federal agency within the Ministry of Commerce. Its mandate is to export raw cotton, sell cotton to local textile mills on government directives, implement the government's cotton policies and the government's price support program for cotton, improve cotton ginning, standardize practices, and develop cotton storage facilities.

4

Reforming the Agrarian Land Market

Moazam Mahmood

Despite attempts at land reform, the agrarian land market in Pakistan remains imperfect and represents one of the major obstacles to increased agricultural output. What market failures characterize the Pakistani land market, how can these market failures be explained, and what kinds of reforms are needed to address these failures?

Imperfections in the Agrarian Land Market

A supply and demand model reveals that the land market imperfections in Pakistan are largely supplyside imperfections; access to both rented and owned area is inadequate and decreasing (Mahmood 1993, 1995). This inadequate access to land is at least partly responsible for production inefficiencies.

Production Inefficiencies Implied by Land Market Imperfections

A major problem in Pakistani agriculture is the large yield gap for the major crops. Relative to Mexico, the yield gap in Pakistan is estimated at two tons per hectare for wheat, or approximately 100 percent of production. The yield gap between best and worst practice within Pakistan is estimated to range between 33 and 50 percent. Growth trends for wheat and rice also show stagnation (Mahmood 1992). This low and stagnating land productivity can be attributed to macroeconomic policy on pricing and suboptimal use of inputs by agricultural producers.

Macroeconomic policy on pricing of inputs and output has been the subject of considerable debate in Pakistan. Agricultural inputs, including fertilizer, pesticides, and canal irrigation, have long been subsidized in Pakistan. Subsidies on inputs other than canal irrigation have been reduced or eliminated as part of the World Bank's structural adjustment loans, which were conditional on demand management to reduce the budget deficit (Banuri, Mahmood, and Rafi 1995). Output prices of wheat, rice, and cotton have been kept below world prices since the 1960s (Cheong and D'Silva 1984; Lewis 1970). Maintenance of output prices below world levels has resulted in net economic outflows from the agricultural sector to the rest of the economy. Domestic terms of trade between agriculture and manufacturing were skewed against agriculture during the 1950s and the late 1960s, adding to the net economic outflow from agriculture (Mahmood 1988). Nominal protection coefficients (NPCs) were gradually raised during the 1980s and 1990s as part of the sector adjustment supply response policy, resulting in a current net outflow from agriculture of about 8 to 10 percent of value added in the sector (Haque 1993).

Individual production decisions are affected by profitability in the sector, the ratio of output in input values and prices, not by NPCs or input subsidies. Several studies have shown that profitability in agriculture improved during the 1980s for cotton as a result of the impact of pesticides on yields and for rice as a result of the premium on basmati rice and the new high-yield variety of basmati rice (Mahmood 1988, 1993; Nabi, Hamid, and Zahid 1986). Micro analyses of investment decisionmaking in both the rural farm and nonfarm sectors show that investment is high in the farm sector and that considerable diversification into the nonfarm sector is taking place, suggesting a higher return in that sector (Mahmood 1995).

The yield gap also reflects lower than optimal input use for the majority of small farms, which are constrained by the lack of internal resources and access to formal sector credit. Considerable evidence suggests that formal sector credit with relatively low interest rates has been monopolized by large farmers for asset acquisition, leaving smaller farmers to depend on informal sector loans for production and consumption smoothing at much higher interest rates (chapter 6). Imperfections in the rural financial market thus contribute to producers' decisions about input use and technical change. Suboptimal use of inputs reflects the structure of land ownership and tenure.

Small farms constrained by credit maximize use of cheap family labor and underuse material inputs. Large farms constrained by supervision costs minimize use of hired wage labor but optimize material input use. Particular forms of land tenure also lead to production inefficiencies. Marshallian disincentives in the traditional sharecropping contract tend to lower input use and land productivity unless input use is stipulated, monitored, and enforced (Mahmood 1988); controlling input use entails high transaction costs to guard against moral hazard. The skewed structure of land ownership and tenure thus leads to production inefficiencies.

Defining Market Imperfections within a Supply and Demand Framework

A market imperfection is a neoclassical notion based on the premise that a market is imperfect if either supply or demand constraints lead to disequilibrium or nonclearing prices. Low demand or demand constraints cannot in principle lead to market imperfections, because whatever the level of demand, market clearing prices and equilibrium will exist as long as there is no supply constraint. A necessary condition for defining market imperfections is the presence of supplyside constraints.

In Pakistan demand for farm land for production, supply of rural land, and rural land prices exist. If land market prices have been stagnating over time, there is no need to look for supplyside land market imperfections. If land market prices have been rising over time, however, supplyside imperfections in the land market can be assumed to exist.

This leaves supply of land and market prices of land. Logically, we should first consider land market prices as a manifestation of land market imperfections. After all, if land market prices were stagnating over time there would be no need to look for supplyside land market imperfections. If, however, land market prices are observed to have risen over time, we can proceed to define supplyside imperfections in the land market.

To determine how land prices have changed over time, Burki (1976) collected land rent data from district revenue officials for 27 villages for the period 1948–69. Renkow (1990) collated rent data from the Punjab Economic Research Institute's (PERI) farm accounts for 60 to 75 farms and collected land price data from a retrospective survey conducted in 1989.

Converted into real terms Burki's land rent series for irrigated Punjab shows declining land rents for the 1959–67 period, after which real land rents rose. Renkow's real land rent data for the period 1963–89 show that rents began to rise in the mid-1960s (table 4.1). The trend growth rate between 1963 and 1989 was 3.1 percent a year for the irrigated rice-wheat zone, 4.1 percent for the rainfed area, and 1.7 percent for Punjab as a whole. Growth was particularly strong for irrigated areas between the mid-1970s and the mid-1980s, when growth rose to 4 percent a year. Table 4.2 reveals that real land prices rose between 1969 and 1980, with irrigated areas in Punjab growing 4.4 percent a year and rainfed areas growing 5.7 percent. Growth was highest for irrigated areas of Punjab during the late 1980s, when land prices rose by 8.1 percent a year.

Given that Punjab represents 60 percent of the cultivated area in Pakistan and that both land and purchase prices have risen there over the past 30 years, supplyside constraints must be operating.

Inadequate Access to Land

Pakistan's average farm size of 9.4 acres compares favorably with other South Asian countries, including India, where the average farm size is 4.2 acres, and Sri Lanka, where the average nonplantation crop farm size is less than 2 acres. Despite the relatively high average farm size, however, Pakistan suffers from the problems of uneconomic holdings because of the strikingly uneven distribution of farm size.

Table 4.1. *Real Land Rent in the Punjab, 1963, 1965–71, 1976–89*
(rupees per hectare)

Period	Rainfed area	Irrigated rice-wheat zone	Entire irrigated Punjab
<i>Pre-green revolution (1963–67)</i>			
1963	287	1,140	1,830
1965	404	—	2,440
1966	381	1,920	2,690
1967	566	1,820	3,090
Average	410	1,730	2,510
<i>Green revolution (1968–71)</i>			
1968	534	1,880	2,840
1969	576	1,830	2,700
1970	561	1,820	2,670
1971	586	1,800	2,560
Average	564	1,830	2,690
<i>Post-green revolution I (1976–85)</i>			
1976	685	1,990	2,680
1977	620	—	3,510
1978	702	—	4,240
1979	693	—	3,460
1980	847	—	3,630
1981	679	3,290	3,470
1982	781	3,280	3,260
1983	1,180	—	2,970
1984	629	—	2,770
1985	757	2,850	3,330
<i>Post-green revolution II (1986–89)</i>			
1986	1,180	2,570	3,780
1987	1,180	2,880	3,470
1988	1,110	3,780	3,900
1989	1,160	3,080	3,720
<i>Trend growth rate of land rent</i>			
1963–89 (percent/year)	4.1	3.1	1.7

— Not available.

Note: All values are expressed in constant (1989) rupees.

Source: Longmire, Asghar, and Farooq (1989); Renkow (1990); PERI farm accounts and family budgets.

Most of the rural population in Pakistan has inadequate access to land. Pakistan inherited from the British an extremely concentrated distribution of owned area and a pattern of land tenure characterized by sharecropping. A complex set of policy factors has caused this concentration to increase over time, further reducing access to land. As shown in table 4.3, by 1954 two-thirds of landowners owned less than 5 acres and controlled only 16 percent of the land in the Punjab; the fewer than 2 percent of landowners who owned more than 50 acres controlled 25 percent of the area, with the 0.1 percent of landowners owning more than 500 acres controlling 10 percent of the area.

All of the high-growth Asian economies with substantial agrarian sectors such as China and Thailand have a fairly even distribution of land ownership. Because farm size and productivity appear to be inversely related, this egalitarian land distribution is likely to have contributed to their economic growth. To the extent that small and medium farms are more productive than large farms, the current size distribution of farms in Pakistan reduces agricultural output.

The extreme concentration of owned area generated a specific pattern of land tenure in Pakistan. The large owned areas implied high supervision costs if self-operated using hired wage labor. By transferring

Table 4.2. *Average Prices and Quantities for Land Transactions in the Punjab, 1960–89*

Period	Rainfed area	Irrigated rice-wheat zone
<i>Pre-green revolution (1960–67)</i>		
Average price (Rs./hectare)	14,400	44,000
Constant value of prices	0.53	0.53
Average quantity/transactions (hectare)	2.80	7.30
Number of transactions	32	35
<i>Green revolution (1968–75)</i>		
Average price (Rs./hectare)	24,800	76,700
Constant value of prices	0.85	0.41
Average quantity/transaction (hectare)	3.60	3.80
Number of transactions	12	12
<i>Post-green revolution I (1976–85)</i>		
Average price (Rs./hectare)	34,400	85,500
Constant value of prices	0.84	0.46
Average quantity/transaction (hectare)	4.00	3.60
Number of transactions	12	19
<i>Post-green revolution II (1986–89)</i>		
Average price (Rs./hectare)	58,600	119,000 ^a
Constant value of prices	0.41	0.34
Average quantity/transaction (hectare)	1.20	3.30
Number of transactions	23	33
<i>Trend growth rate of land prices</i>		
1960–89 (percent/year)	5.70	4.40

Note: All land prices are expressed in constant (1989) rupees.

a. Average price is significantly higher than the average price in the preceding period at the 5 percent level.

Source: Renkow (1990).

Table 4.3. *Land Ownership in Colonial Punjab*
(percent of total)

Acreage owned	All Punjab				West Punjab, 1954–55	
	1924		1939			
	Number	Area	Number	Area	Number	Area
Less than 5	58.7	12.0	63.7	12.2	66.4	15.7
5–<15	26.0	26.6	24.0	22.2	23.6	25.0
15–<25	7.0	15.2	5.8	12.8	5.4	14.0
25–<50	4.8	20.4	3.9	14.8	4.1	21.9
More than 50	3.3	25.7	2.4	38.0	0.5	13.6
50–<500	—	—	—	—	—	—
More than 500	—	—	—	—	0.1	9.9

— Not available.

Source: Data for 1924 were calculated from Calvert (1925); data for 1939 were calculated from Hamid (1982); data for 1954–55 are from Government of West Pakistan (1959).

some incentives to the tenant, sharecropping this large owned area allowed these large landowners to reduce high supervision costs (Mahmood 1993) and resulted in the pattern of land tenure shown in table 4.4. By 1947 only 40 percent of the area in Punjab was self-cultivated, the remaining 60 percent was operated by share tenants. More than 50 percent of the area was operated by tenants-at-will.

Table 4.4. *Land Tenure in North India, 1947 and 1888*
(percent of total)

<i>Type of tenancy</i>	<i>West Punjab, 1947</i>	<i>All Punjab and NWFP, 1888</i>	
	<i>Area</i>	<i>Number</i>	<i>Area</i>
Owner cultivator	39.7	47.7	60.7
Nonrent tenants	0.8	2.8	0.7
Occupancy tenants	5.5	0.0	0.0
Tenants-at-will	51.4	49.6	38.6

Note: NWFP Northwest Frontier Province.

Source: Data for 1888 were calculated from Calvert (1925); data for 1947 are from Government of West Pakistan (1959).

How did the supply of land change over time? Between 1959/60 and 1992/93 the reported area rose by about 10 million hectares (table 4.5). The cropped area rose by about 5 million hectares, largely because of the increase in irrigated area caused by the increased use of tubewells. By 1992/93 the cultivated area represented 27 percent of total area, with irrigated land accounting for 21 percent of total area and unirrigated land accounting for 1 percent of total area.

Changes in Concentration of Owned Area over Time

A system of land inheritance characterized not by primogeniture but by some division of land among all issue should result in a decrease in land concentration over time, as shown in figure 4.1. Initial land ownership distribution at time t_1 is a skewed distribution, reflecting the high incidence of small farms bunched at the lower end of the size scale and a long right tail reflecting the low incidence of very large farms. The splitting up of holdings over time should move the right tail of very large owners to the left and move the high incidence mode of small owners farther to the left, as given by t_2 (the subsequent land distribution). t_1 should move left, down the size scale to t_2 over time, decreasing land concentration.

In Pakistan the actual distribution of owned area has not conformed to the pattern predicted by idealized demographic dynamics: between 1980 and 1990 the Gini coefficients for concentration of owned area rose from 0.6434 to 0.6546 (following a decline from 0.6578 in 1972 to 0.6434 in 1980). This increase in concentration of owned area between 1980 and 1990 can be decomposed by size (table 4.6). The mean owned area in Pakistan dropped from 13.1 acres in 1972 to 11.7 acres in 1980 and 9.8 acres in 1990. Between 1972 and 1980 this decline reflected a drop in the mean of every size class. Between 1980 and 1990, however, the decline reflected a decrease in the mean of all size classes below 150 acres only; for the largest size class the mean holding size rose from 302 acres to 338 acres. By 1990 the more than half of all landowners who owned less than 5 acres controlled 12 percent of the land area in Pakistan while the fewer than 3 percent of owners who owned more than 50 acres controlled 33 percent of all land; the 0.5 percent of landowners who owned more than 150 acres controlled 17 percent of total area.

Figure 4.2 shows the actual distribution of owned areas in Pakistan between 1972 and 1990. Between 1972 and 1980 the distribution moves to the left, as expected. Between 1980 and 1990, however, the right elongated tail of large owners moves farther to the right.

The fact that the concentration of land in Pakistan is increasing despite demographic dynamics that tend to diminish concentration suggests that large owners are compensating for the effects of inheritance patterns by acquiring new land. In some cases large owners who divided up their land among family members to evade land reform during the 1960s and 1970 now feel sufficiently secure politically that they are registering their holdings in consolidated form; in other cases large owners are simply purchasing more land.

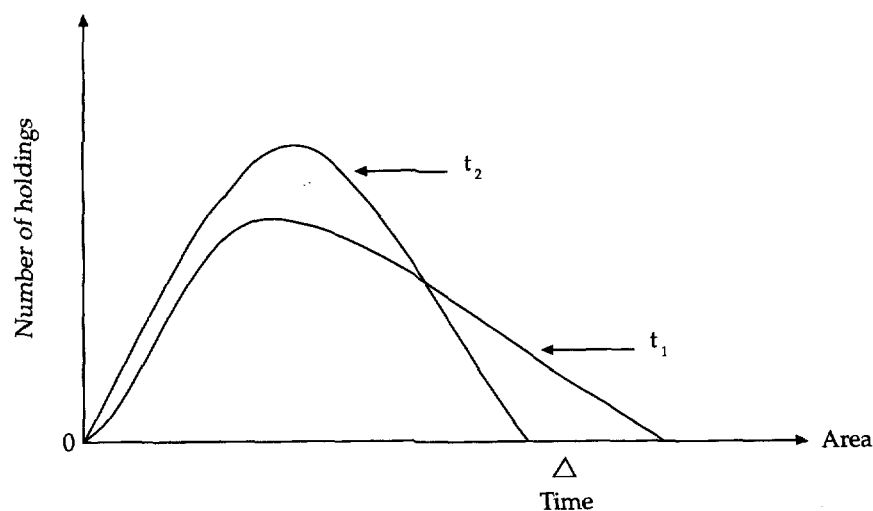
Table 4.5. Supply of Agricultural Land, 1959/60–1992/93
(millions of hectares)

Year	Total area	Reported area	Forest	Not available for cultivation	Cultivable waste	Cultivated	Total irrigated	Canal	Tubewell	Other
1959/60	79.6 (100.0)	48.5 (60.9)	1.3 (1.6)	20.6 (25.9)	10.0 (12.6)	16.5 (20.7)	10.4 (13.1)	8.7 (10.9)	0.2 (0.3)	1.5 (1.9)
1964/65	79.6 (100.0)	52.8 (66.3)	2.0 (2.5)	18.8 (23.6)	13.4 (16.8)	18.7 (23.5)	11.4 (14.3)	9.0 (11.3)	0.5 (0.6)	1.9 (2.4)
1969/70	79.6 (100.0)	52.9 (66.5)	1.8 (2.3)	20.4 (25.6)	11.5 (14.4)	19.2 (24.1)	12.5 (15.7)	9.3 (11.7)	1.1 (1.4)	2.1 (2.6)
1974/75	79.6 (100.0)	53.9 (67.7)	2.8 (3.5)	20.3 (25.5)	11.3 (14.2)	19.6 (24.6)	13.3 (16.7)	10.1 (12.7)	2.4 (3.0)	0.8 (1.0)
1979/80	79.6 (100.0)	53.7 (67.5)	2.8 (3.5)	18.8 (23.6)	11.9 (14.9)	20.2 (25.4)	14.7 (18.5)	10.7 (13.4)	2.7 (3.3)	1.3 (1.6)
1984/85	79.6 (100.0)	58.1 (73.0)	3.2 (4.0)	23.3 (29.3)	11.1 (13.9)	20.6 (25.9)	15.8 (19.8)	11.9 (14.9)	3.3 (4.1)	0.6 (0.8)
1989/90	79.6 (100.0)	58.0 (72.9)	3.4 (4.3)	24.8 (31.2)	8.8 (11.1)	20.9 (26.3)	16.9 (21.2)	11.6 (14.6)	4.3 (5.4)	1.0 (1.3)
1992/93	79.6 (100.0)	58.1 (73.0)	3.5 (4.4)	24.4 (30.7)	8.8 (11.1)	21.4 (26.9)	16.9 (21.2)	12.0 (15.1)	4.3 (5.4)	0.6 (0.8)
1960–93	0.0 (0.0)	9.6 (12.1)	2.2 (2.8)	3.8 (4.8)	1.2 (-1.5)	4.9 (6.2)	6.5 (8.1)	3.3 (4.2)	4.1 (5.1)	-0.9 (-1.1)
<i>Growth rates (percent per year)</i>										
1959/60 to 1964/65		1.7	8.6	-1.8	5.9	2.5	1.8	0.7	18.3	4.7
1964/65 to 1969/70		0.0	-2.1	1.6	-3.1	0.5	1.8	0.7	15.8	2.0
1969/70 to 1974/75		0.4	8.3	-0.1	-0.4	0.4	1.2	1.7	15.6	-19.3
1974/75 to 1979/80		0.0	0.0	-1.5	1.0	0.6	2.0	1.2	2.4	9.7
1979/80 to 1984/85		1.6	2.7	4.3	-1.4	0.4	1.4	2.1	4.0	-15.5
1984/85 to 1989/90		0.0	1.2	1.2	-4.6	0.3	1.3	-0.5	5.3	10.2
1989/90 to 1992/93		0.1	1.0	-0.5	0.0	0.8	0.0	1.1	0.0	-17.0
1960–93		0.5	3.0	0.5	-0.4	0.8	1.5	1.0	9.3	-2.8

Note: Figures in parentheses represent percent of total area.

Source: Government of Pakistan, *Economic Survey*, 1995.

Figure 4.1. Predicted Impact of Classical Demographic Dynamics on Land Ownership



Source: Author's simulation.

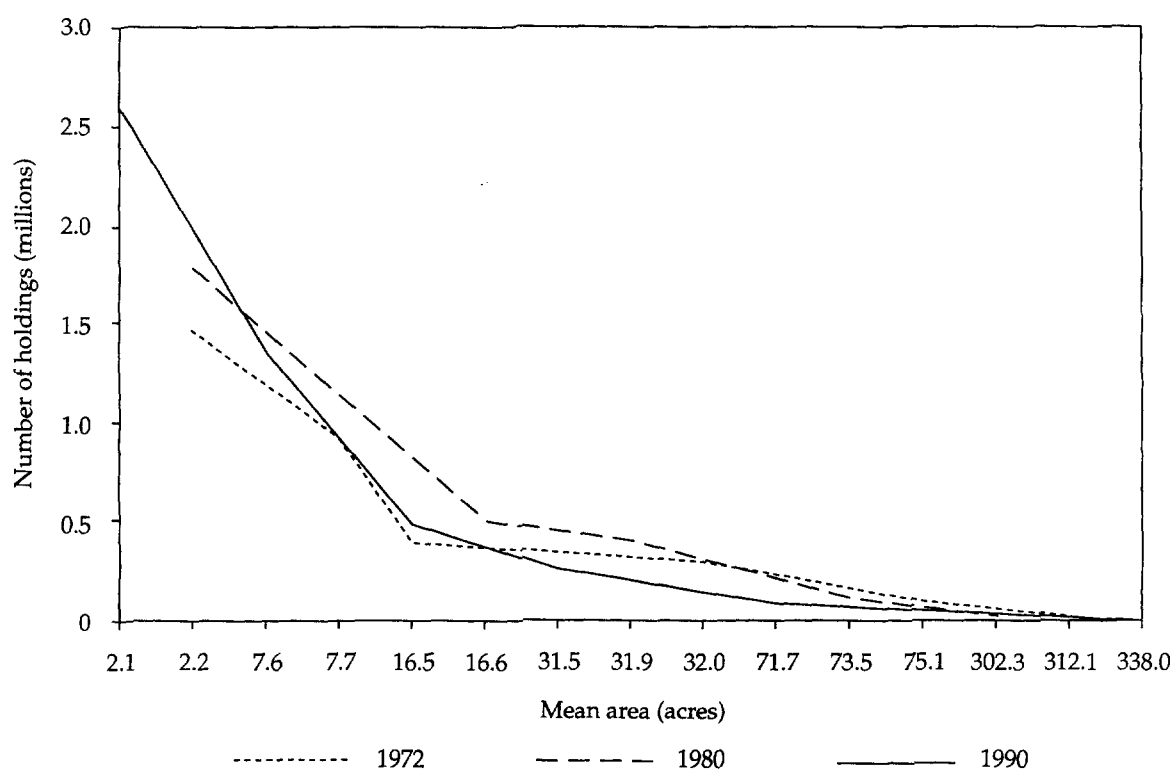
Table 4.6. Distribution of Owned Area in Pakistan, 1972, 1980, and 1990

Farm size (acres)	1972				
	Number	Percent	Area (acres)	Percent	Mean area (acre)
<5	1,478,803	47	3,199,368	7	2.2
5-<12.5	904,369	29	6,967,293	17	7.7
12.5-<25	421,446	13	6,945,365	17	16.5
25-<50	217,177	7	6,948,459	17	32.0
50-<150	114,382	4	8,589,597	21	75.1
>150	28,422	1	8,869,905	21	312.1
Total	3,164,599	100	41,512,987	100	13.1

Farm size (acres)	1980				
	Number	Percent	Area (acres)	Percent	Mean area (acre)
<5	1,783,771	47	3,870,599	9	2.2
5-<12.5	1,131,588	30	8,725,821	19	7.7
12.5-<25	499,535	13	8,276,075	19	16.6
25-<50	229,674	6	7,333,226	17	31.9
50-<150	118,674	3	8,723,404	20	73.5
>150	24,752	1	7,483,711	17	302.3
Total	3,787,994	100	44,412,836	100	11.7

Farm size (acres)	1990				
	Number	Percent	Area (acres)	Percent	Mean area (acre)
<5	2,619,444	54	5,386,324	12	2.1
5-<12.5	1,343,229	28	10,220,868	21	7.6
12.5-<25	508,818	11	8,376,119	18	16.5
25-<50	227,733	5	7,171,634	15	31.5
50-<150	110,657	2	7,929,318	17	71.7
>150	24,083	0.5	8,139,061	17	338.0
Total	4,833,964	100	47,223,324	100	9.8

Source: Calculated from Government of Pakistan, *Agricultural Census*, 1972, 1980, 1990.

Figure 4.2. *Distribution of Owned Area, 1972, 1980, and 1990*

Source: Government of Pakistan, *Agricultural Census*, various years.

Changes in Concentration of Operated Area over Time

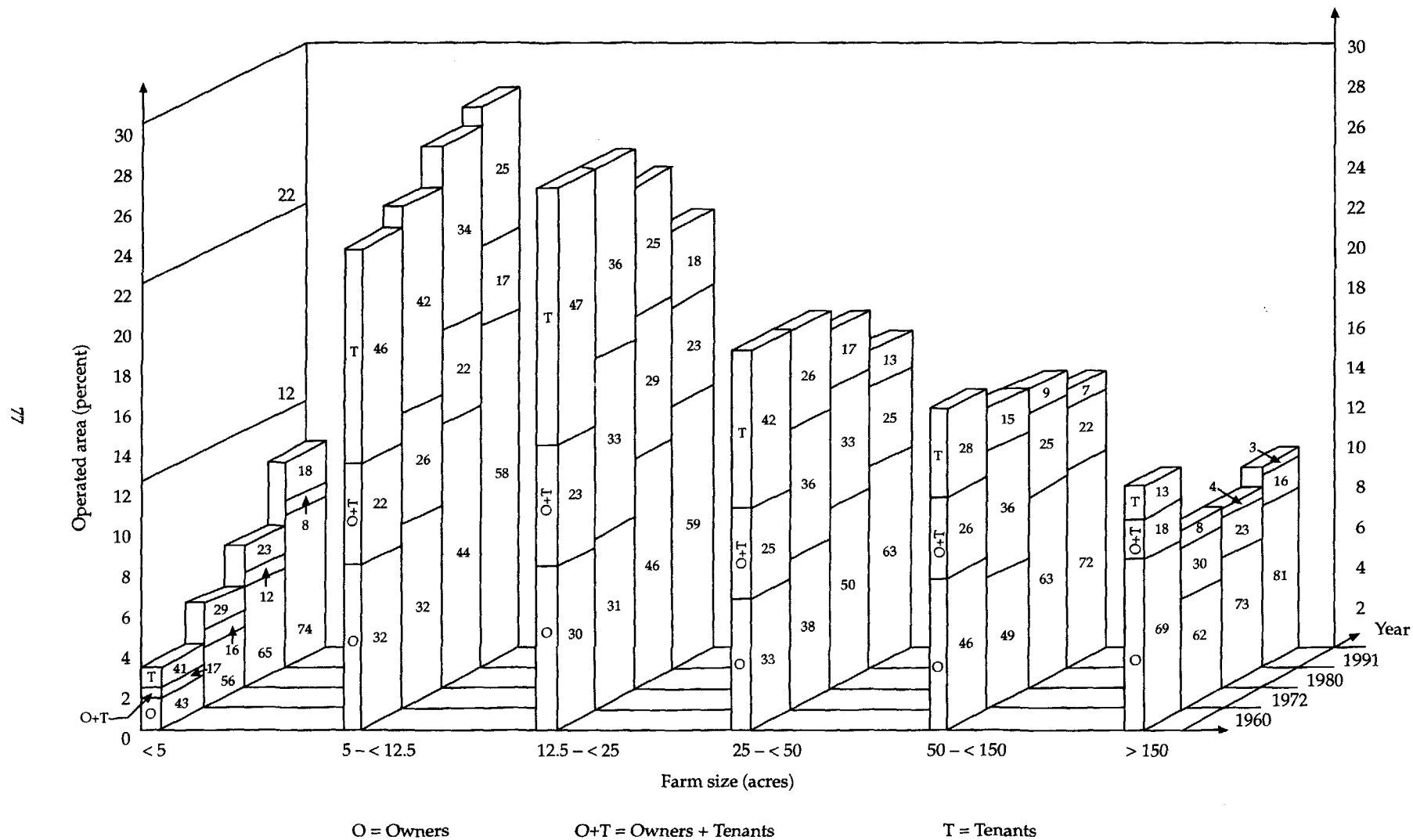
Table 4.7 gives the Gini coefficients for concentration of operated area for 1960, 1972, 1980, and 1990. The Gini shows a consistently increasing trend between 1960 and 1990 (from 0.5137 to 0.5835), with the largest increase occurring between 1980 and 1990. The decomposition of this increased concentration of operated area is shown in figure 4.3, which shows that the proportion of operators working fewer than 12.5 acres and more than 150 acres has increased while the proportion of operators working between 12.5 and 50 acres has decreased. This squeezing out of middle-size operators can be explained by a simple tenorial change over time. In each size class the proportions of pure tenants and owners-tenants has decreased. Table 4.8 shows that this decrease is the result of owner-operators resuming operation of land farmed by sharecroppers. Between 1960 and 1990 owner-operated area rose from half to three-quarters of total operated area while sharecroppers' area fell from 44 percent to 19 percent. Despite this decline, sharecropping remains the major form of tenancy, with fixed-rent leasing stagnating at 7 percent of total operated area

Table 4.7. *Gini Coefficients for Operated Area in Pakistan, 1960, 1972, 1980, and 1990*

Year	Gini coefficient
1960	0.5137
1972	0.5177
1980	0.5353
1990	0.5835

Source: Calculated from Government of Pakistan, *Agricultural Census*, 1960, 1972, 1980, 1990.

Figure 4.3. Distribution of Operated Area in Pakistan, Selected Years, 1960-91



Source: Government of Pakistan, Agricultural Census, various years.

Table 4.8. *Distribution of Rented Area, Selected Years, 1960–92*
(percent)

Year	Operated area (acres)	Owner-operated	Rented		
			Sharecrop	Fixed	Other
1960	<5	52.4	41.5	3.8	2.3
	5–<12.5	43.9	49.4	5.2	1.5
	12.5–<25	42.5	51.7	4.4	1.5
	25–<50	46.7	48.3	3.6	1.4
	50–<150	61.3	34.4	2.8	1.5
	>150	82.2	14.0	2.4	1.5
	Total	51.0	43.5	4.0	1.6
1972	<5	63.0	30.8	4.9	1.3
	5–<12.5	42.9	50.9	5.5	0.7
	12.5–<25	45.2	47.6	6.6	0.7
	25–<50	54.5	36.6	8.1	0.8
	50–<150	67.5	23.0	8.5	0.9
	>150	79.3	12.3	6.9	1.5
	Total	53.8	38.6	6.8	0.8
1980	<5	70.7	24.9	4.0	0.4
	5–<12.5	53.7	40.7	5.2	0.3
	12.5–<25	58.7	34.2	6.5	0.6
	25–<50	64.9	26.6	7.6	0.9
	50–<150	76.9	15.3	6.7	1.1
	>150	85.8	6.8	6.4	1.1
	Total	64.3	28.9	6.2	0.7
1992	<5	77.3	17.4	4.8	0.5
	5–<12.5	65.3	27.5	6.6	0.6
	12.5–<25	68.6	22.9	8.1	0.5
	25–<50	73.7	18.0	7.8	0.5
	50–<150	82.0	10.3	7.1	0.6
	>150	90.4	4.1	4.8	0.7
	Total	73.5	10.2	6.8	0.6

Source: Calculated from Government of Pakistan, *Agricultural Census*, various years.

for the last three decades. This change in operated area can also be observed in terms of the distribution of owned area size classes (table 4.9). In 1972 about 60 percent of the owned area was self-operated, with the remaining 40 percent rented out. By 1990 three-fourths of the owned area was being self-operated, with only one-fourth rented out. The largest class of owners, which once rented out almost two-thirds of its owned area, now rents out slightly more than 40 percent of its land.

Why has operated area become more concentrated over time? Macro pricing policy has gradually increased profitability per acre on all farms, owner-operated and sharecropped. The increased profits per acre on sharecropped area are divided between the landlord and the tenant, however, and are thus lower than profits on self-operated areas. This profit differential creates a strong incentive for large landowners who sharecrop areas to either raise the share rental or resume self-cultivation. The ability to raise share rentals is based on bargaining power; where land concentration is very high, the terms of the sharecropping contract have been observed to be transformed along Cheungian lines. Where land concentration is relatively low, however, landlords are often unable to change share rents. In theory these landlords could transform share rents into fixed-rent leasing. Fixed-rent leasing has not emerged as a secure form of land rental in Pakistan, however, implying that the only option for such landlords is to resume self-cultivation of land previously rented out to sharecroppers (Mahmood 1988, 1993).

Table 4.9. Owned Area Operated, 1972, 1980, and 1990
(acres)

Year	Size class of owned area	Total	Distribution of owned area			
			Self-operated		Rented out	
			All area owned	Part area owned	Part area owned	No area owned
1972	All farms	41,519,987	17,938,811 (43.2)	6,541,804 (15.8)	7,007,329 (16.9)	10,032,043 (24.2)
	<5	3,199,368	2,236,468 (69.9)	69,466 (2.2)	59,799 (1.9)	833,725 (26.1)
	5-<12.5	6,967,293	4,782,082 (68.6)	405,909 (5.8)	309,454 (4.4)	1,469,848 (21.1)
	12.5-<25	6,945,365	4,057,141 (58.4)	853,094 (12.3)	623,662 (9.0)	1,411,468 (20.3)
	25-<50	6,948,459	2,986,733 (43.0)	1,301,234 (18.7)	1,098,507 (15.8)	1,561,985 (22.5)
	50-<150	8,589,597	2,548,281 (29.7)	1,903,827 (22.2)	1,985,269 (23.1)	2,152,220 (25.1)
	>150	8,869,905	1,328,106 (15.0)	2,008,274 (22.6)	2,930,728 (33.0)	2,602,797 (29.3)
1980	All farms	44,412,853	24,750,678 (55.7)	5,521,992 (12.4)	5,247,590 (11.8)	8,892,593 (20.0)
	<5	3,870,606	2,937,279 (75.9)	56,541 (1.5)	50,077 (1.3)	826,709 (21.4)
	5-<12.5	8,725,820	6,557,803 (75.2)	378,939 (4.3)	295,264 (3.4)	1,493,814 (17.1)
	12.5-<25	8,276,074	5,531,626 (66.8)	748,967 (9.0)	598,516 (7.2)	1,396,965 (16.9)
	25-<50	7,333,225	4,026,914 (54.9)	998,094 (13.6)	898,927 (12.3)	1,409,290 (19.2)
	50-<150	8,723,412	3,731,449 (42.8)	1,512,204 (17.3)	1,530,995 (17.6)	1,948,764 (22.3)
	>150	7,483,716	1,965,607 (26.3)	1,827,247 (24.4)	1,873,811 (25.0)	1,817,051 (24.3)
1990	All farms	47,223,329	30,812,063 (65.2)	39,679,968 (8.4)	4,406,950 (9.3)	8,036,348 (17.0)
	<5	5,386,331	4,514,645 (83.8)	55,066 (1.0)	53,193 (1.0)	763,427 (14.1)
	5-<12.5	10,220,861	8,185,167 (80.1)	327,394 (3.2)	292,263 (2.9)	1,416,037 (13.9)
	12.5-<25	8,376,114	6,101,140 (72.8)	527,435 (6.3)	480,025 (5.7)	1,267,514 (15.1)
	25-<50	7,171,628	4,580,814 (63.8)	482,230 (9.5)	659,394 (9.2)	1,249,190 (17.4)
	50-<150	7,929,325	4,249,039 (53.6)	981,605 (12.4)	1,041,577 (13.1)	1,657,104 (20.9)
	>150	8,139,070	3,181,258 (39.1)	1,394,238 (17.1)	1,880,498 (23.1)	1,683,076 (20.7)

Note: Figures in parentheses represent percent of total.

Source: Calculated from Government of Pakistan, *Agricultural Census, 1972, 1980, 1990*.

Lack of a Fixed-Rental Leasing Market

Increasing profits per acre will affect the production and investment behavior of all producers, large and small, owners and tenants. Farmers' responses to increased profits will depend on the size of their farm landholdings. Small farmers have been noted to use a high level of family labor inputs and to be constrained by lack of credit and internal resources with which to acquire material inputs. If the value of output minus inputs rises, small farmers will attempt to increase their yield to maximize their profitability per acre. Because their use of inputs is suboptimal, they can maximize their profitability per acre by increasing their use of material inputs per acre. They may also want to increase their acreage owned or rented. Because the resource gap associated with increasing acreage is larger than the resource gap associated with increasing material inputs, farmers will first attempt to increase their use of material. If a large fixed-rent leasing market that allowed small farmers to rent land rather than buying it existed, farmers would face a smaller resource gap and could consider both options in response to increased profitability.

Large farmers have been seen to use a lower level of labor inputs because of the high supervision costs of using hired wage labor and a higher level of material input use because of their more abundant internal resources and their access to formal sources of credit. Therefore, as profitability per acre increases, large farmers can attempt to increase their yields either by increasing their (suboptimal) labor inputs per acre or by increasing their acreage. Because labor inputs per acre continue to be constrained by high supervision costs and may therefore not be a viable option for large farmers, increasing acreage is favored. This increase in owned area by larger owners results in the increased concentration of owned area. Similarly, confronted by increasing profitability per acre, large owners sharecropping out area resume self-cultivation because they are constrained from increasing their share rents or converting share rents into fixed-rents. Were they able to convert their share rents into fixed-rents and not resume self-cultivation, the concentration of operated area would not increase on this count.

The lack of a well-functioning fixed-rental market is thus the major cause of the observed increase in concentration of owned and operated areas and the decreasing access to land. A fixed-rent leasing market would allow small farmers to increase their mean area and mitigate the small farm size effect and would allow landlords to convert share rents to fixed-rents.

The absence of a fixed-rent land market in Pakistan is puzzling, because both small operators and large owners appear to demand area for fixed-rent leasing to increase their profits. If both demand and supply conditions for fixed-rent leasing exist in Pakistan, why has this form of rental stagnated at 6 percent of the operated area over the past three decades? One explanation is that, unlike the share rental market, the fixed-rental market is not secure. Under a share rental arrangement the right to decisionmaking in production is not surrendered for the period of rental: the landlord has *de jure* rights to participate in the operation of the land rented out to the tenant. Sharecropping is thus a joint market for the land of the owner and the labor of the tenant.

The fixed-rental market is a pure land market, in which the landlord must surrender all rights to the land for the duration of the rental period. At the end of the rental period landlords have two means of reclaiming their land if faced with a dispute with the tenant: they can use extraeconomic coercion or bargaining power (that is, they can enforce the contract personally) or they can rely on the state to enforce the contract. Self-enforcement of the contract entails high transaction costs; state enforcement entails no transaction costs. Because the probability of state enforcement of the fixed-rental contract is extremely low in Pakistan, self-enforcement of such contracts is necessary. These high transactions costs markedly reduce the incentive to enter into fixed-rental agreements.

Why is state enforcement of the fixed-rental contract in Pakistan weak? Are state functionaries simply corrupt or does low probability of state enforcement reflect an institutional lacuna? The corruption argument is weak for two reasons. First, it is the large landlords, with a large potential supply of fixed-rent area, who have the internal resources to bribe officials to enforce fixed-rent contracts. Second, rent-seeking behavior has to be based on rent-seeking ability, and it is institutional weaknesses that provide the opportunity for rent seeking.

The Land Titling System in Pakistan

The land title system in Pakistan is archaic because its primary function was originally tied to the revenue function (box 4.1). The role of the subordinate bureaucracy, from *patwaris* through the *kanungos*, *naib tahsildars*, and *tahsildars* to the deputy commissioners, was to provide a chain of authority with which to ease and expedite the flow of revenue. An important part of this exercise was the maintenance of the record of rights, or *jamabandi*, which needed to be carefully maintained in order to serve as an accurate record of revenue payers. Because the authorities' goal in recognizing ownership was to avoid instabilities, conflicts, and dramatic changes in the landholding structure that would affect the collection of land revenue, the *jamabandi* cited rights of owners other than the absolute owner, thus diluting the rights and hold of absolute owners over agricultural land.

Had administrative efficiency been maintained at the level achieved by the British, the *jamabandi* system could have provided a workable land titling mechanism for Pakistan. Various inefficiencies and distortions have penetrated the system, however, and these maladjustments are now so extensive as to call for a major reevaluation of the principles and practices of land title registration and its relationship to agricultural land as a factor of production and salable commodity.

Under the British, field boundaries were remeasured and the village map was supposed to be revised at each revenue settlement. In practice such revision did not always take place and over time ownership recorded in official records did not reflect actual land ownership. After 1947 this situation was exacerbated by the virtual cessation of land revenue resettlement. Although the Pakistani bureaucracy was equipped with better resources than the British—better technology for analysis, better communications infrastructure, superior numbers, and better educated staff—it failed to produce a regular revenue resettlement or a gazetteer of even one district. This failure suggests that high-level bureaucrats lack the ground level experience needed to monitor, analyze, and understand the conditions of land title registration and do not grasp the extent to which the land market is malfunctioning.

The central reason that land records are no longer maintained properly is the decline since 1947 in the importance of land revenue as a source of state income. Once the major source of revenue for the British in India, land revenues now represent only a small fraction of tax receipts. Under the Peoples Party government of Zulifqar Ali Bhutto in the 1970s, holders of up to 12.5 acres were exempt from payment of land revenue, thus removing a large proportion of revenue payers from the tax nexus. Under the Zia-ul-Haque regime the introduction of *ushr* effectively exempted the overwhelming majority of rural landowners from revenue payment, thus leaving only Shias and non-Muslims, representing about 1 percent of all landowners, within the land revenue system. Total land revenue collected in the Punjab now stands

Box 4.1. The Legacy of the British

In South Asia the state has traditionally claimed a share of the produce from land, which it obtains from the party to whom it grants the permanent right to occupy and cultivate the land. This share of the produce turned over to the state is known as *land revenue* and was viewed as a form of rent rather than as a tax. Pakistan's institutional capacity for registering and monitoring land transactions is a legacy of the system established by the British, who adopted many systems used by the Mughals, who in turn retained many practices from earlier times.

For the British, and presumably also for their predecessors, land revenue was by far the most important form of state income. The British claimed to levy revenue at levels much lower than former rulers, but they laid strong emphasis on the efficiency of collection. Collection could be effective only if the colonial bureaucratic system, and more specifically the land revenue administration, functioned smoothly and efficiently. On this revenue collecting structure rested the fiscal basis for the functioning of the entire British Indian Empire. Not only did such income meet the entire cost of the British presence in India, both military and civilian, but it also underwrote the substantial sums transferred to Britain as the infamous Home Charges, or the costs incurred by the British for governing India.

at only about Rs 10 million rupees, a marginal income source for the state. This drastic reduction in the significance of land revenues has further reduced the incentives of the *patwari* and supervisory staff to keep records up to date.

Patwari officials and supervisory staff (the *kanungo*, *naib tahsildar*, and *tahsildar*) are supposed to record all changes in ownership and tenancy at the village level within three months of the change in status; every four years the *jamabandi* is supposed to be updated. In practice records are either not kept current or vary significantly from actual ownership. *Patwaris* in rural areas often reside in large towns and cities and appoint agents in their stead, who are often corrupt. Having delegated their functions to agents, the *patwaris* no longer serve as the local representative of the administration, and many of the *patwaris'* functions, including field inspections, from which the cropping pattern was recorded and the output level of cultivated land estimated, are no longer performed. The supervisory staff no longer check the *patwaris'* entries and records carefully (or at all), but instead participate in the *patwaris'* bribe-taking activities. Although these problems are widely acknowledged, no systematic research effort has been undertaken to quantify the seriousness of the problem and determine its impact on the land market. Such a study would help policymakers formulate the basis for reform of the system and should be undertaken.

The current system of recording land ownership was developed at a time when the amount of land in question was much smaller than it is today. Established in the time of Sher Shah Suri, the system was functionally appropriate at a time when agricultural landholdings probably represented only a small fraction of landholdings today. Even under the British, the Financial Commissioner's Office, which handled revenue matters, operated in a much more limited environment, and that office commanded enormous prestige and status. The current apex office, the Board of Revenue, lacks the importance of the old Financial Commissioner's Office. Given the inaccuracy of the current recordkeeping system, the enormous size of the system, and the lapse of supervision and controls at the lower and middle management levels, it is unlikely that the information flow to the Board of Revenue or its structure allows it a dynamic decisionmaking role.

Over time the effectiveness of monitoring and control by top management over the land registration system at the local level has declined, enabling lower management to manipulate the system to its own benefit. All levels of the bureaucracy reportedly share in the rents generated by these lower officials. One method through which the *patwaris* have exercised control over land records is the peculiar numbering, signs, and symbols system they employ. These practices make it difficult for outsiders to read these documents, thus giving the *patwaris* a monopoly over their use. The *patwaris* also often introduce errors into these documents, either deliberately or through genuine mistakes. This increases their own manipulative power and causes considerable inconvenience to the public. The fact that such practices continue unabated indicates the weakness of the stimulus for reform within the bureaucracy. For the land market to function efficiently, terminology and numbering systems must be standardized, readily understood by lay people, and easily transferable to computers.

The introduction of Islamic laws of inheritance has further complicated the land registration system. Under the customary laws of inheritance only males were typically eligible for succession. Under Islamic law the more equitable basis of allowing female inheritance is followed. While this has introduced much needed gender rights, it has also greatly increased the number of claimants and added to the complexities of an already entangled property rights system. One of the major obstacles to rationalization of land ownership in Pakistan is that so much land is held jointly. Under current law, holdings of up to 12.5 acres cannot be subdivided for sale and joint holdings cannot be sold off if one of the owners objects to the sale. A great deal of litigation in land cases concerns these joint or undivided holdings. The inclusion of women has added to the difficulties of managing and rationalizing joint ownership, further constraining the land market.

A Strategy for Agrarian Land Market Reform

Because of market imperfections, access to land is limited in Pakistan and landholdings are highly concentrated, adversely affecting agricultural output. These land market failures must be addressed and reforms introduced so that the market functions more efficiently.

Past Efforts at Reform and Impediments to Market Efficiency

Past land reforms in Pakistan have failed, with only about 1 million hectares of land redistributed under the 1959 and 1972 reforms (box 4.2). Declarations of landholdings were very low and landholders used a variety of means, including transfers to family members, to conceal the true size of their holdings. Only a fraction of land supposed to be transferred to tenants and others was actually allotted, although former tenants who were never given actual ownership and possession were registered as landowning recipients, and many large landlords lost no land whatsoever. The subordinate bureaucracy played an integral role in creating these distortions in land records and probably represented a major reason that the state lost control over lower officials, helping to consolidate the links between low-level officials and the landowning elite.

Few data exist on how those who received land under the reforms fared. As in other countries, the reforms may have been counterproductive because policies aimed at handing over land to sitting tenants may have led to displacement of tenants by landlords fearful of future land redistribution. Certainly the reforms, which targeted exiting tenants, did little to help landless laborers.

State policies have tended to discourage nonagricultural elements from investing in agricultural land. The physical withdrawal of a sizable proportion of this class in 1947 on the basis of religion further weakened the state's capacity to penetrate and transform agricultural operations through the

Box 4.2. *The Failure of the 1959 and 1972 Reforms in Pakistan*

Until 1959, land reform in Pakistan aimed more at providing security of tenure and occupancy rights to tenants than at redistributing land. Major redistributive reforms were initiated in 1959 and 1972. Both reforms were ceiling-based redistributive reforms, meaning that a maximum permissible farm size was set and any land above the maximum was taken by the government for redistribution to small farmers, usually the sitting tenants.

The 1959 reform set a ceiling on landholdings of 500 irrigated acres or 1,000 nonirrigated acres, a much higher ceiling than in other countries in the region, such as Sri Lanka, where a ceiling of 50 acres was established, or Bangladesh, where a ceiling of 33.3 acres was established. Substantial exemptions were also granted, and only 5,000 landowners ended up declaring land in excess of 500 acres, far below the actual number of such farms. Although about 1 million hectares of land was redistributed, only about 8 percent of subsistence farmer households benefited. Moreover, resales were made well below market prices and many farmers immediately sold the land back to the large landholders.

The 1972 land reform was more far-reaching. The ceiling on holdings was reduced to 150 irrigated acres (300 nonirrigated acres), or 15,000 produce index units (PIUs), whichever was greater, and no compensation was provided for expropriated land. An additional exemption of 2,000 PIUs was allowed on mechanized farms, which considerably diluted the impact of the ceilings. Hering and Chaudhry (1972) estimated that the tractor and tubewell exemptions raised the effective ceiling from 300 acres to 350 acres. The exemption for tractors not only undermined the reform, it also encouraged massive mechanization of farms in the 1970s, displacing labor.

Land redistribution was based on several criteria, but the process was open to influence from large landlords. Market-based methods of land redistribution were not adopted and wide discretionary powers were granted to local officials. Nonofficial inputs to the process were discouraged. With local participation in the reforms essentially ruled out, the task of collecting adequate information to implement the reform was difficult. Landlords typically had much greater influence with the local bureaucracy than tenants, further compounding the problem.

It is not clear that adequate provisions were made for tenants once they were given control of land. The 1959 reform made special credit concessions for new tenants, for example, a feature lacking in the 1972 reform. While special credit may not always have been desirable, its provision recognized that the new owner might experience transitional difficulties in taking control of the land, particularly since the previous owner surrendered the most marginal land. In the absence of credit from other sources, former tenants turned to their previous landlords for credit, reviving the dependency that the reform was supposed to remove.

Tenants were granted security of tenure and freedom from eviction without just cause. Enforcement of this provision was lax, however, and the law was easily circumvented. The law also regulated sharecropping contracts, and there is some evidence that this provision helped sharecroppers by relieving them of the obligation to perform nonfarm labor for landlords.

land proprietorship route. Even after official controls were lifted, the continued resilience of agricultural elites created informal disincentives and barriers to land ownership. The complexities and distortions in the land registration system and its manipulation by local officials and incumbent elites have also contributed to the constraints facing the agricultural land market.

With the introduction of production index units (PIUs) under the Bhutto government in the 1970s, local officials participated in estimating land areas with landholders, providing liberal opportunities for manipulation. Once again initiatives by the state became the basis of a renewed round of graft and distortion by the lower bureaucracy in concert with locally dominant groups.

Enacting Effective Land Market Reform Measures

Part of the reform of the land registration system will need to address the possibility of revamping the role of the provincial Boards of Revenue to allow them to deal more effectively with the growing backlog of litigation and appeals. The extended time periods needed for resolution of cases and the large number of cases that remain unresolved act as a constraint on bureaucratic and judicial effectiveness, on agricultural output, and on civil harmony.

An intermediate level of record maintenance could be considered. Moving records to a centralized location, such as the Board of Revenue or the Directorate of Land Records, is one option. Such a provincial-level central depository of land records could reduce the level of local manipulation. Centralization of these records would also increase inaccessibility, however, and could create an unwieldy and inefficient structure. Simply shifting venues and retaining an outmoded manual system could be counterproductive and any change in the system should seek to incorporate computerization. If the infrastructure, services, and available skills permit computerization at the district, or *tahsil*, level, records should be kept there. Divisional offices could be selected for maintaining records for districts that lack the resources to computerize. Flexibility should be maintained in the choice of location so that these records could be moved to the district level once the district was able to maintain them electronically.

Selecting an executing agency for producing and operating a new system of land records will be of vital importance. Computer-based operations are still in an elementary stage in government offices in Pakistan, and the process might well become bogged down in administrative inertia if left to the bureaucratic agency. Quality control problems might also emerge. The option of divesting operations and implementation to a professional agency, perhaps operating in the private sector, should be considered.

The costs and benefits of land reforms should be studied carefully before new reforms are considered (box 4.3). Certain actions are clearly called for immediately, however, including the following:

- Removing distortions in the machinery and credit markets that have facilitated self-cultivation at the expense of tenants
- Granting tenants-at-will greater security of tenure
- Enforcing the security-of-tenure provisions of the 1972 land reform
- Improving the operations of land markets by streamlining the land titling and registration process
- Penalizing unproductive land use by aiming at full cost recovery in service provision, particularly for irrigation water
- Using a land tax to increase the efficiency of land use.

Box 4.3. Land Reform Experiences in Other Developing Economies

Successful land reform has played an important equity role in East Asia, especially in the Republic of Korea and Taiwan (China), where gains in productivity were considerable (World Bank 1993). These reforms advanced equity goals by establishing the principle of shared growth, which enhanced the legitimacy of governments and the popular ownership of the growth process. Even if the productivity difference between different classes of farms is slight, it is important that all farmers have equal access to land in a nondistorted land market.

The Korean and Taiwanese reforms were implemented by relatively authoritarian governments partly seeking to neutralize the appeal of communism. In Taiwan (China) the government seized land from landlords, who were compensated with shares in state enterprises. Land was then sold to the tiller at favorable prices on favorable credit terms. Technological assistance was also provided to the new owners. The Korean reform provided only nominal compensation and eliminated tenancy at a stroke.

In contrast, the Philippines has a long history of failed land reforms, the most recent of which took place in the late 1980s. These laws have been riddled with loopholes and have been poorly implemented and enforced. As in Pakistan, reform lacked the speed and finality of successful reforms elsewhere.

Chile's experience is also instructive. The Chilean land market was in chaos in the early 1970s, as uncompleted land reform had resulted in half of all agricultural land being held by the public sector following expropriation. In 1974 the government began distributing land in irrigated 8-hectare plots to establish family farms. Titles were assigned to more than 100,000 small farmers and 68,000 indigenous people over three years. Some expropriated land was returned to its previous owners and the rest was auctioned. The land rental market was liberalized, water rights were separated from land rights and made transferable, and legal commitment was given to secure the property rights of farmers.

5

Improving Irrigation and Drainage

Masood Ahmad and Rashid Faruquee

Pakistan's arid to semi-arid climate and inadequate water resources make nonirrigated agriculture impossible. Irrigated land accounts for 76 percent of total agricultural land and more than 90 percent of the value of agricultural production (box 5.1). Irrigated land area increased from 9.25 million hectares in 1950/51 to 17.20 million hectares in 1994/95, an increase of 1.5 percent a year. The increase in irrigated area was most significant before 1980, when the irrigation system was being expanded. Since the 1980s, increases in irrigated area have come from groundwater tubewells; the area irrigated by canals has remained unchanged. Because the development of water resources is approaching its limits, there is little potential for further increase in irrigated areas (box 5.2).

Box 5.1. Pakistan's Natural Water Resources

Pakistan has significant water resources, but they are inadequate for crop production on the available land. The country is divided into three hydrological regions: the Indus Basin, which covers 70 percent of the country's area; the Kharan Desert in West Baluchistan, which has inland drainage; and the arid coast along the Arabian Sea in southern Baluchistan. The Indus River and its tributaries are the main sources of water, delivering an average of 147 million acre feet of water annually, mostly from glaciers, snow melt, and rainfall outside the Indus Plain. The rivers flowing to the Kharan Desert have annual flows of about 0.28 million acre feet; the Makran coast flows deliver about 1.55 million acre feet of water a year. The Thar and Cholistan Deserts, in the south, have no water resources.

Box 5.2. The Indus Basin Irrigation

The Indus Basin Irrigation system, the largest contiguous irrigation system in the world, consists of three major reservoirs with storage capacity of about 15 million acre feet, about 19 barrages, and 43 major canals. Canals cover about 61,000 kilometers, with more than 110,000 watercourses covering another 1.6 million kilometers.

Roughly 106 million of the 147 million acre feet of annual inflow to the Indus river and its tributaries is diverted to canals of the Indus Basin Irrigation System (IBIS). River water is diverted by barrages and weirs into the main canals and subsequently into branch canals, distributaries, and minors. The flow to the farm is delivered by watercourses, which are supplied by outlets (*mogha*) from the distributaries and minors. The *mogha* is designed to allow a constant discharge that self-adjusts to variations in the parent canal. Each watercourse is a miniature irrigation system, covering between 200 and 700 acres. Farmers receive water proportionate to their land holdings, and water is rotated among farmers on a weekly basis according to a fixed schedule.

Every season the Water and Power Development Authority (WAPDA) estimates water availability for the following season in consultation with the Provincial Irrigation Departments. During the season the departments communicate their water demand to WAPDA at specific points in the system at 10-day intervals. WAPDA then releases water from the reservoirs, and the provincial departments allocate and distribute the water among their canal commands.

WAPDA is responsible for the operation and maintenance (O&M) of large multipurpose reservoirs and interprovincial link canals. O&M of the distribution system above the *mogha* is the responsibility of the provincial departments; the government is responsible for providing drainage.

The Limited Prospects for Increasing Water Supply and the Need to Improve System Efficiency

Irrigation and the drainage sector play key roles in sustaining future agriculture growth in Pakistan. In the past, water supplies for irrigation were expanded significantly by capturing more water from the river system. With completion of the Mangla Reservoir in 1967 and the Indus Basin Works in 1974, annual water diversions to the canals increased from about 80 million acre feet to about 90 million acre feet. Construction of the Tarbela Dam and limited expansion of canal-commanded areas increased average canal diversions to about 106 million acre feet annually, the level at which they have remained since 1980.

Prospects for major increases in water supply to canals appear limited. River flows are fully utilized, except during the flood period in Kharif. The Water Apportionment Accord of 1991 allocated 117.35 million acre feet of water among the provinces, an increment of about 12 million acre feet. Incremental water above the current level of diversions is available for a short duration only and is not sufficient to mature a full crop. Canal capacities permitting, a limited quantity (about 2 million acre feet) can be used for relieving water stress in existing cropped areas. The utility of the flood water is thus very marginal unless additional storage is provided to lengthen the supply period. Providing more storage in the system could increase water captured by 15 million acre feet (14 percent) over the current level of diversions. However, additional canal capacity, which could be acquired either by remodeling the existing system or by building new canals, would be required to utilize these flows. Such investments would be very expensive and relatively uneconomic.¹

Prospects of extending irrigation outside the Indus Basin are limited. About 2.2 million hectares of land are located outside the Indus canal-commanded area, scattered in relatively small parcels with water coming from open wells, tubewells, lift pumps, karezes, springs, and small diversions. Water sources for perennial irrigation outside the Indus system are largely exhausted. Some extension in partial irrigation is feasible by using flood flows and water harvesting and about 16,000 hectares could be brought under irrigation by harnessing the hill torrents on the right bank of the Indus. These schemes are costly, however, and water supplies are not reliable for high-yielding crops.

Groundwater use, which has been a major source of growth in agricultural production in Pakistan over the past two decades, also seems to be reaching its upper limit. In addition to supplying additional water, groundwater tubewells provide flexibility to match canal supplies with crop water requirements. Before the 1960s, development of groundwater was limited to open dug wells operated by animal power, generally located outside the canal-command areas. Public investment in groundwater tubewells in salinity and control reclamation project (SCARP) areas to control waterlogging and salinity in the late 1950s was followed by a virtual explosion in private tubewell development, which grew by about 6 percent annually. Currently more than 300,000 private tubewells supply about 40 percent of total irrigation water in Pakistan. As a result of increasing extraction from the aquifers, the groundwater table in most fresh groundwater areas is falling, limiting the potential for further groundwater development. There is some scope for partial recovery of recharge in moderately saline groundwater areas, where lenses (thin discontinuous layers) of fresh groundwater could be exploited using appropriate technology. Another exploitable source of groundwater is the riverine areas, where about 0.5 million acre feet of total groundwater potential of 2.5 million acre feet a year could be developed annually. Effective utilization would be lower because these supplies can be used only during *Rabi* season.

Water supply (and hence agricultural growth) could be expanded greatly by improving the efficiency of the existing system; investments in improving efficiency also have high economic returns. Benefit-cost ratios of irrigation system rehabilitation and on-farm water management investments range from 2.5 to 6.0 at 12 percent. Reforms are needed just to sustain the current system, which faces serious problems, as outlined

1. Water Sector Investment Planning Study (WSIPS) estimates a net benefit-cost ratio of 1.6 at 12 percent for storages in the Indus system; the benefit-cost ratios for command area extension projects are estimated at 7.0 for the Dajal Branch Extension, 1.0 for the Greater Thal Canal, and 0.4 for the Rainee Canal projects.

in the next section. In the past, efforts to improve the efficiency of the existing system consisted largely of physical improvements, such as rehabilitation of the canals, improvement of watercourses, and land leveling. Gains achieved through such measures have been offset by deterioration of the system because of poor performance by the public institutions that handle the irrigation and drainage sector in Pakistan.

Institutional reform should be the main focus of development of irrigation in Pakistan in the future. Increasing efficiency of the irrigation system will require substantive improvement in water management as well as increased water supply and will demand better financial, managerial, and technical planning. The performance of the sector will depend on redefining the roles of the public and private sectors and enhancing the capabilities of both.

Major Inherent Problems of the Existing System

Rigid system design and inadequate drainage, low delivery efficiency and inequitable distribution of water, waterlogging and salinity, and overexploitation of groundwater in fresh areas represent major problems in Pakistan's irrigation system.

Rigid System Design

Pakistan's irrigation systems were designed as run-of-the-river to maximize cropped area with minimum water consumption and simple operation and administration. Also, the system was designed for insurance against water scarcity than for productivity. Canals were intended to provide equitable distribution of water with minimum human interference. Few structures regulate canal flow, and outlets run whenever a distributary or minor is running. No escapes are provided at the tail of the system and surplus flows have to be absorbed within the command. The canals are unlined, designed to remain in equilibrium under varying sediment loads. These features, suitable for the low cropping intensities for which they were originally intended, now represent constraints on water management. Improving the canals through remodeling would be costly, however, especially since major canals cannot be shut down for long periods and constructing and operating parallel canals would be difficult.

Although the development of barrages, reservoirs, and link canals has provided more control over distribution, the irrigation system is operated on historic canal diversion patterns that in many cases no longer correspond to water requirements. Inefficient reservoir capacity combined with the highly seasonal pattern of river flows, which provide roughly 85 percent of water during the summer, result in inadequate water availability at the beginning and end of the summer and during the winter. This mismatch between water supplies and water requirements constrains agricultural production.

Each watercourse is a miniature irrigation system, with channels up to 10 miles long. Watercourse commands range from 200 to 700 acres, with discharges of 1 to 3 cusecs. Each command is divided into 25-acre squares, each of which has access to the public watercourse at a single point and includes a network of farm channels. Because the average farm is much smaller than 25 acres and parts of the farm are not cropped each season, channels can take up as much as 8 percent of the square's area. A better-organized square would allow for more cropping area and less water loss. Improved layouts of farm land with shorter and fewer farm channels could also improve on-farm delivery efficiency. Redesign of farm layout would require land consolidation or integration, however, which is difficult in Pakistan because of poor land records. More efficient designs could easily be adopted in new areas, however. Reducing the length of public watercourses by increasing the number of minors could also increase efficiency, but could be implemented only if farmers assumed responsibility for the operation and maintenance (O&M) of minors and distributaries.

Inadequate Drainage

Flat topography and lack of well-defined natural drainage in the Indus Plain create a surface drainage problem, which has been compounded by the construction of roads, railways, flood embankments, and

irrigation systems that obstruct natural drainage flows. Over the years more than 14,000 kilometers of surface drains have been constructed in Punjab and more recently in tail reaches of Rohri and Nara canal commands in Sindh. The surface and subsurface drainage systems in the irrigated areas of Pakistan are inadequate. Under SCARP attempts were made to meet the subsurface drainage needs through deep tubewells. A limited area is provided with tile drainage. Since the 1960s efforts have been made to provide drainage in the irrigated areas and several large drainage programs are ongoing. Out of the gross canal-commanded area of 16.7 million hectare acres, about 6.5 million hectare acres require drainage, of which about 1.86 million hectare acres are covered under ongoing projects (table 5.1). Providing drainage to such a vast area is a large undertaking. About 50 projects are planned to cover the entire area requiring drainage, some consisting of several subprojects. About 15 of these projects are ongoing and 35 are new. Some 43 drainage schemes were proposed in the Eighth Five-Year Plan, several of them extended beyond the fiscal year plan period. An area of about 2.38 million hectare acres is estimated to have a water table of less than 5 feet. The government considers such areas disaster areas and gives them high priority for drainage. Ongoing projects cover about 0.85 million hectare acres of designated disaster areas.

Provision of drainage is essential for maintaining the agriculture sector resource base: disposal of drainage effluent in the rivers, canals, and evaporation ponds will not be feasible in the long run. An outlet to the sea with link drains from the rest of the basin will be required to carry highly saline effluent to the sea. Drainage investments are highly viable, with rates of return close to 20 percent.² The absence of natural drainage and the continuous nature of the Indus Plain groundwater system requires that all drainage infrastructure be developed in an integrated manner. Independently developed local schemes may be in danger of being overwhelmed by neighboring undrained areas with high water tables and becoming ineffective. Because of the large scope of the investments and cross linkages, balanced development in the drainage sector requires integration of local area drainage needs and such infrastructural developments as outfall drains for the conveyance of drainage effluent from larger tracts.

Low Delivery Efficiency and Inequitable Distribution

The Indus Basin Irrigation System (IBIS), an extensive network of barrages, canals, and watercourses, is the mainstay of irrigated agriculture in Pakistan. As a result of age, overuse, and poor maintenance, canal

Table 5.1. *Scope of Drainage Requirements in Pakistan*

<i>Area</i>	<i>Gross area (millions of hectares)</i>	<i>Share (percent)</i>
Gross area	16.67	100
Total area requiring drainage	11.46	69
Area under completed projects	5.85	35
Area requiring drainage in future	6.50	39
Under ongoing project	1.86	11
Remaining area	4.64	28
New area	3.75	22
Under completed projects requiring drainage	0.89	5
Area with water table less than 5 feet in April/June 1989/90	2.39	14
Under ongoing projects	0.85	5
Under completed projects requiring drainage	0.51	3
Remaining area	1.03	6

Source: Government of Pakistan.

2. The estimated economic return of SCARP IV was estimated to be 19 percent; the actual economic rate of return was 18 percent for SCARP Mardan and Left Bank Outfall Drainage.

delivery is extremely inefficient. Average delivery efficiency is 35 to 40 percent from the canal head to the root zone, with most losses occurring in watercourses. The loss of such a large proportion of surface water reduces water available for crops and contributes to waterlogging and salinity.

In many irrigation systems with drainage, excess water and water lost in irrigation return to the river, to be used again downstream. The loss in efficiency to the river basin is thus lower than the loss to any single scheme. In Pakistan, however, return flows are negligible. Reuse is limited to some seepage losses in areas located over fresh groundwater; in saline areas water is permanently lost. Given Pakistan's almost complete dependence on irrigation and the shortages of water that are anticipated in the future, the efficiency of the irrigation delivery must be improved. Improvements in irrigation delivery efficiency are also critical to prevent waterlogging and salinity and to provide additional drainage.

Inequitable distribution represents another serious problem. Because of poor efficiency water does not reach users at the tail end of the system, at least not at the rate intended in the system's design. Illegal pumping from canals exacerbates the inequitable distribution of water.

Waterlogging and Salinity

Soil salinity may be robbing Pakistan of about 25 percent of its potential production of major crops (World Bank 1992a). In an environment like the Indus Basin (flat topography, poor natural drainage, porous soils, semi-arid climate with high evaporation) irrigation without adequate drainage will inevitably lead to rising water tables and salinity. The increase in the diversion of river flows for irrigation and seepage from canals, watercourses, and irrigated areas has meant a gradual rise in the groundwater table. By the 1960s a series of SCARPs was initiated. Despite these efforts, however, about 30 percent of the gross commanded area is waterlogged, of which about 13 percent is considered highly waterlogged.

Even if irrigation water is relatively free of salts, repeated irrigation and the rise in the water table will dissolve salts in the soil and bring them toward the surface. About 8 percent of the gross commanded area is estimated to be severely affected by salt; another 6 percent is believed to be moderately affected.

Overexploitation of Groundwater in Fresh Water Areas

Groundwater use has contributed to increased agricultural production since the late 1970s. Groundwater tubewells not only supply additional water but provide flexibility to match surface water supplies with crop water requirements. The explosive growth in groundwater use by the private sector (6 percent annual growth in number 2 private tubewells) may cause saline water to contaminate freshwater aquifers by excessive lowering of water tables in fresh groundwater areas. Furthermore, in many canal-commanded areas, where canal water is not sufficient because of inequitable distribution, farmers depend on tubewells and tend to overexploit groundwater. In the absence of adequate leaching and effective conjunctive use of surface and groundwater, excessive pumpage introduces salinity in the root zone.

Problems Caused by Inadequate Planning or Supervision by the Government

Areas in which government intervention could improve the irrigation system include:

- Operation and maintenance of the system
- Recovery of O&M costs
- Long-range investment planning
- Project planning and management
- Construction industry
- Interagency coordination
- Pollution control measures.

Inadequate Operation and Maintenance

Pakistan's irrigation and drainage system has been deteriorating because of deferred maintenance and utilization beyond design capacities. The system is plagued by low delivery efficiency, with only 35 to 40 percent of water from the canal head reaching the root zone. Most losses occur in the watercourses and only a small portion of water lost in the system is recovered through tubewells.

To catch up with deferred maintenance the government embarked on an Irrigation System Rehabilitation Program in the 1980s. Provinces increased O&M funding by more than 15 percent a year under the first Irrigation Systems Rehabilitation Project (ISRP-I). Under the second Irrigation Systems Rehabilitation Project (ISRP-II), 1988 O&M funding levels for surface irrigation and subsurface saline facilities were considered adequate and spending on O&M of public groundwater tubewells was excluded on the assumption that they would be privatized. Provinces agreed to maintain the 1988 levels of expenditure on surface irrigation and subsurface saline drainage facilities in real terms. Actual expenditure fell far short of 1988 levels in all provinces except the Northwest Frontier Province (NWFP): overall the gap is more than 24 percent, with gaps as high as 37 percent in some regions (Sindh). Privatization of groundwater tubewells has proceeded more slowly than planned and in Punjab and Sindh, where most of these tubewells are located, O&M requirements are twice as high as estimated. Had O&M requirements of publicly owned tubewells been included, the financing gap would thus have been even larger.

Inadequate Cost Recovery of O&M Expenditure

In the not too distant past capital costs of irrigation development were recovered from users. In recent years, however, water and drainage charges have been intended to cover only O&M. Charges are not linked to actual O&M needs but are collected by the Provincial Revenue Departments and become part of provincial revenues. The gap between O&M expenditure and recoveries through water charges has been increasing, reaching 44.4 percent in 1992 (table 5.2 and 5.3). In Punjab and Sindh the gap is about 30

Table 5.2. O&M Expenditure and Recoveries, 1988/89–1992/93
(millions of current rupees)

<i>Fiscal year</i>	<i>Expenditures</i>	<i>Recoveries</i>	<i>Shortfall (percent)</i>
1988/89	1,703.9	987.1	-42.1
1989/90	1,512.8	1,027.7	-32.1
1990/91	1,616.5	962.2	-40.5
1991/92	1,707.8	1,196.6	-29.9
1992/93	1,985.4	1,104.5	-44.4

Source: Government of Pakistan.

Table 5.3. O&M Funding Requirements, 1988/89–1992/93
(millions of current rupees)

<i>Year</i>	<i>Requirements^a</i>	<i>Expenditure^a</i>	<i>Shortfall (percent)</i>
1988/89	1,703.9	1,703.9	0.0
1989/90	1,874.9	1,512.8	-19.3
1990/91	2,160.6	1,616.5	-25.2
1991/92	2,408.3	1,707.8	-29.1
1992/93	2,619.9	1,985.4	-24.2

a. Includes O&M expenditure on surface irrigation and subsurface saline drainage facilities; excludes public tubewells in fresh groundwater tubewells and surface drains. Requirements are based on targets agreed upon with the World Bank under ISRP-II project.

Source: Government of Pakistan.

percent and would have risen to more than 60 percent if expenditures on public tubewells had been included; relative to recoveries, the overall gap would have been 57 percent. In NWFP and Baluchistan the gap is as high as 80 percent.

Inadequate O&M is largely the result of inadequate institutional capability and lack of funding. Operating under a structure and set of rules formulated more than 100 years ago, Provincial Irrigation Departments (PIDs) resist any form of institutional change, modern technology, or management practice. Emphasis on technical performance is declining, along with the PIDs' ability to enforce statutory provisions of the Canal and Drainage Act, the foundation of good irrigation practice.

Funds allocated to PIDs by provincial governments are insufficient for proper O&M (table 5.3). The shortfall stems from low water rates and inadequate assessment and collection of charges. Water charges in Pakistan apply only to surface water supply and are imposed on a crop acreage basis that varies with the type of crop grown. Rates are currently set significantly below the level needed to recover O&M expenditures. Revenue collection and implementation of O&M are undertaken by different agencies and revenue does not go directly to the PIDs, thus eliminating incentives to improve water delivery and the collection of charges.

The price of irrigated water grossly understates the true value of water to agricultural producers. Based on actual prices paid by farmers in private sales, the value of water to users is as much as 10 times higher than current official charges. The difference between the cost and the value of water represents a hidden gain, or rent, to water users and distorts the use of the system, causing a breakdown in system discipline and unequal distribution as users struggle to capture this rent through illegal pumping or breaking the *mogha* or the *warabandi*.

Farmers willingly make informal payments to irrigation system officials to obtain additional water. Yet they are unwilling to pay even the current low O&M charges because they are seen as unrelated to any water deliveries or O&M services they may receive from the PIDs. At the same time, PID budgets are unrelated to water charges, making them independent of and indifferent to user requirements, although they may be responsive to individual users as part of rent seeking.

Poor Investment Planning

Investment planning for irrigation and drainage is conducted at three levels in Pakistan. Sectoral plans establish a medium- to long-term framework for sectoral development, five-year plans are used for short-term planning, and yearly allocations are made by the Annual Development Program (ADP). In the past much effort has gone into sectoral planning. Plans such as the Revised Action Program and Water Sector Investment Planning Study (WSIPS), prepared with foreign assistance, take a comprehensive look at sectoral requirements and objectives. These plans are rarely incorporated wholly into either five-year plans or the ADP, however, and institutional and policy recommendations are often ignored. Instead, the tendency is to invest in poorly planned civil works packages.

Another problem is the ADP process, which is long and complex. Proposals pass through various federal and provincial departments and committees, and planning is based on financial limits set each year by the federal government. The overriding concern is the allocation of provincial and sectoral shares rather than the aims and performance of projects, and investments are mainly driven by the supply side, with little regard for implementation requirements and sectoral priorities.

Inadequate Project Preparation and Lack of Project Ranking

No identifiable rational process for identifying and prioritizing investments in irrigation and drainage exists in Pakistan. Project approval follows guidelines issued by the Planning Commission in the 1960s, and feasibility reports contain insufficient information on which to implement projects successfully. Moreover, provincial and federal agencies are unable to prepare projects effectively: projects prepared by the government often use cost estimates that are distorted by out-of-date rate schedules and designs that use obsolete techniques and guidelines, and interproject and intersectoral linkages are generally not considered.

Because of the inability of the government to prepare projects, feasibility plans for externally assisted projects are usually prepared by consulting firms, which help the agencies in planning and development. Few domestic consulting firms are qualified to undertake these assignments, however, and ambiguous regulations, unfair hiring practices, and the complexity of hiring consultants limit their use.

Project approval is slow and often based on affordability and social benefits rather than on economic criteria. Projects are approved as they are proposed, thus facilitating the politicization of the process. Moreover, even if a project is economically viable it is unlikely to be approved if it is not included in the current five-year plan. Finally, no process exists for evaluating and ranking potential projects.

These shortcomings were among the major constraints affecting performance during the Seventh Five-Year Plan and were summarized in the water sector working paper prepared for the Eighth Five-Year Plan (1992). By and large each project is revised time and again in terms of cost, schedule, and benefits, disturbing the investment plan and adversely affecting policies and targets. The need for proper planning, project preparation, cost estimation, and monitoring during implementation for each water development and drainage project is critical. Continuous monitoring and periodic reviews are necessary for corrective action to complete the project within the envisaged time and cost.

Declining Investment Financing and Inadequate Capital Cost Recovery

Pakistan's irrigation and drainage system has been almost entirely funded by the public sector. Given the political climate and the state of the banking system in Pakistan, the costs of establishing the infrastructure to achieve economies of scale could not have been met by the private sector. Subsequent tubewell irrigation investment did involve substantial private sector investment, an indication of the ability and willingness of the private sector to finance further development.

Since the mid-1980s public spending on irrigation has been declining by about 4 percent a year in real terms. Completion of projects underway has been delayed and there has been a tendency to start new projects without ensuring the availability of funds, further delaying completion. Funds available for project implementation have been severely reduced because of the high rate of interest charged to the project during construction due to the prolonged implementation period. One major reason for the shortage of development funds is the failure to recover capital costs from users. In the past some capital costs were recovered under provisions of the Canal and Drainage Act. Land previously classified as waste (uncultivated) was sold to farmers upon irrigation development. Privately owned land that was farmed was also subject to "betterment charges" following irrigation from a public system (Scott and Redding 1988). Water charges, too, included a component for capital cost recovery. In 1972/73 and 1973/74 revenue receipts were higher than the total O&M expenditure by 13 and 25 percent. Revenue receipts fell below the O&M expenditure for the first time in 1974/75 and capital cost recovery has lapsed since then, with water charges set to recover O&M costs only. The single exception is the On-Farm Water Management Program, in which about 30 percent of the cost of some materials is recovered.

Inadequate Contracting and Construction Industry

Monitoring and evaluation of project implementation and capabilities for construction management is weak in Pakistan and irrigation and drainage projects have been plagued by implementation problems associated with inefficient operation and management of private contractors, although large contracts for construction of link canals, barrages, and dams under the Indus Basin Project were completed on time and within estimated costs.

Because good local contractors are rarely attracted to irrigation works, preferring more profitable building construction, local irrigation contractors tend to be small, poorly equipped, and poorly managed. Large projects are usually foreign financed and most local contractors do not meet the criteria for international competitive bidding. Public companies and departmental work forces are used preferentially, contracting practices are inequitable, the business environment and institutions remain underdeveloped, employers

treat contractors as adversaries rather than as partners in project development, and resource management and joint venture formation are lacking.

Poor Interagency Coordination

Interagency coordination between the agriculture and irrigation agencies, which is crucial for efficient use of water, is almost nonexistent. Studies in the late 1970s identified inadequate agency coordination and noninvolvement of beneficiaries as one of the major constraints to agricultural production, and both the Revised Action Program for Irrigated Agriculture and the National Commission on Agriculture recommended the consolidation of the irrigation and agricultural agencies as long ago as 1978.

The WSIPS recommended that an independent commission review the responsibilities, performance, coordination mechanism, problems, and constraints of the irrigation and drainage institutions. During preparation of the Eighth Five-Year Plan, it appeared that the government recognized the urgency of tackling the administratively and politically difficult problem of interagency coordination.

Excessive Municipal and Industrial Pollution

Only 25 percent of the more than 33 million people residing in urban centers in Pakistan have flush sanitation, and most sewage and other wastewaters collected are discharged untreated into drainage and river systems. No controls prevent the discharge of industrial wastewater effluent and only 3 percent of industries are believed to treat their effluent according to international standards. As a result, harmful pollutants end up in irrigation and drinking water downstream from urban areas and plants.

Delta Ecology

The Water Apportionment Accord recognized the need to minimize escapades to the sea (below the Kotri barrage), to check seawater intrusion up the Indus River, and to reduce environmental degradation. To estimate the available water for irrigation use upstream and assess the viability of additional storage, it is critical to determine both the quantity and the timing of the water to be released into the delta system. Both the Accord and the Eighth Five-Year Plan stated that the optimum flow below the Kotri is 10 million acre feet annually. The same figure can be used to estimate the available water for future development, at least until the Indus River Authority makes a final decision on minimum flow.

Lack of Management Information Systems

Management information systems with which to track information on the irrigation system are lacking in Pakistan. Discharge data of rivers and tributaries are inconsistent and out of date. Records of water diversions to the distributaries, minors, and outlets are either not kept or are inaccessible. Monitoring data and other information on groundwater are not cataloged electronically, but are recorded on paper and difficult to access.

Appropriate accounting of water is critical to investment planning and efficient resource use; use of simulation and optimization models to assist in systems operations (reservoirs, canals, distributaries, and minors) is essential. Computerized databases for land records and cropped areas could assist in advance crop planning, water demand forecast, revenue collection, and maintenance of canals.

The Source of the Problem: Water as a Public Good

Waterlogging and salinity, overexploitation of fresh groundwater, low efficiency in delivery and use, inequitable distribution, unreliable delivery, and insufficient cost recovery are not the causes of Pakistan's inadequate irrigation system but symptoms of a deeper problem: the treatment of irrigation water as a

public good. In fact, water is a private tradable good, for which markets can operate, as they currently do informally. Lack of well-defined individual property rights and the banning of the sale of surface water severely constrain informal irrigation water markets.

Rather than addressing the roots of the deficiencies of the system, the government has continued to treat water as a public good, causing inefficient pricing of water, misallocation of resources, and widespread rent-seeking behavior. The problems of the system have been compounded by inadequate public sector investment in drainage, unsatisfactory management of public expenditure, and deteriorating institutional capability. Without the introduction of the right incentives, economic efficiency in the delivery of water cannot be achieved and the system cannot be sustained financially.

Efficient Pricing of Water

Creating water user rights and legalizing water trading can be expected to provide a transparent market value for water and its opportunity cost, promoting more efficient use of the resource through equalization of the marginal value product of water in its alternative uses (box 5.3). In the long run, efficient allocation of water is achieved when the marginal value product of water is equal to the marginal cost of supplying it. If demand for water cannot be satisfied in the short run by charging a marginal delivery cost, a capacity constraint exists and an optimal allocation is achieved when the marginal value product of water in one use reflects the (opportunity) cost of foregoing its use in the best alternative activity, that is, when marginal value products are equalized.³ In an ideal irrigation system, in which the water utility has the flexibility to supply water in response to user demand, the market price for water will distribute the resource optimally, because irrigators will bid up the price of water until marginal returns are equalized. If the price does not reflect opportunity costs, overconsumption and wastage occur.

Because the Indus Basin system operates at its capacity limit, the opportunity cost of one unit of water (its marginal value product in agricultural use) overestimates the short-run marginal cost of running the system. The system was designed to deliver water in proportion to landholdings. If all farms had the same agricultural production function and were equipped with the same inputs of other factors, such as labor, fertilizer, and tractors, such a system would result in efficient use of the limited resource (Rhodes and Sampath 1988). In fact, there is substantial variation in water efficiency across regions and across crops that cannot be explained by diverging transportation and delivery costs. The average financial return to water is Rs 700 per acre foot, but ranges from Rs 0 to Rs 2,000, suggesting significant variations in marginal returns to water. Because water, not land, is the constraining factor in agricultural production, the average and the marginal productivity of water can be expected to move together. Prices in informal local water markets reveal huge variations. Privately pumped tubewell water prices range from Rs 100 to Rs 400 per acre foot; informal water sales that take place along a watercourse range from Rs 100 to Rs 700 per acre

Box 5.3. The World Bank's Water Pricing Policy

According to World Bank policy, water charges should contain a component that taxes water users progressively, thereby reducing income inequality in the agricultural sector. A two-tier pricing system, consisting of a variable charge based on the cost of delivering the volume of water used and a fixed charge that is independent of volume, can create a progressive tax that is acceptable locally in the sense of charging rich and poor alike the same per unit for the same delivery service. To meet the costs of the utility, including connection costs and other financial burdens, the fixed charge could be adjusted. It could also be set progressively, increasing with the size of the landholding.

3. An equalization of marginal value products assumes that delivery costs are equal. If substantial divergences in transportation costs exist, net rents are equalized (marginal value product minus marginal cost of obtaining it).

foot. External impacts occurring after the cropping decision make equalization of the marginal returns to water impossible. But the large divergence in returns and prices signals high potential output gains that could materialize if available water were allocated more efficiently.

Data constraints make it difficult to determine actual long-run marginal costs for individual users and to disaggregate the individual categories of marginal costs. Practical billing necessities often render detailed long-run marginal cost pricing uneconomical. For political reasons unified regional or provincial rates might have to be adopted. Irrigation agencies often supply water to remote areas, where marginal costs outweigh opportunity costs. In such cases the government could pay the agency the difference between the delivery cost and the O&M charge prior to actual delivery (that is, the cost of implementing the social program). Such programs divert the agency from its basic objective of cost-effective delivery of irrigation water, however, and cause a breakdown in user discipline as more and more users seek preferential treatment, expanding the beneficiary group until the program becomes a severe financial burden to the public sector.

Unlike on-farm drainage, off-farm drainage is a public good, because it is not possible to exclude individuals from the areawide drainage benefit of lowering the water table. Thus, off-farm drainage should continue to be provided by the government. The underlying problem of inappropriate institutional framework will require reforms that will ensure autonomy, transparency, and accountability within the current institutional setup.

Sustainable Cost Recovery

Replacement of PIDs with public utilities, coupled with development of water markets based on water property rights, facilitates both efficient water pricing and sustainable cost recovery. Cost recovery should reflect the full O&M charges of delivering a unit of water, including the costs of the provincial and federal water authorities; it should not cover past capital expenditures. All future investment costs, however, for additional and replacement capture, storage, and delivery should be fully recovered through delivery charges, the sale of rights, or both. Long-term development planning must take these charges into account in estimating future demand for irrigation and these costs must be made explicit by utilities in delivery contracts with user organizations.

Delivery charges that cover the full cost of O&M costs would not be burdensome for users. Current O&M charges represent only 5 percent of either costs of production or farm income and cover 70 percent of total O&M charges. Full recovery of current O&M charges would require the doubling of the rate charged. With no increase in delivery efficiencies, the increased charge amounts to Rs 40 per acre foot at the *mogha* and Rs 70 per acre foot in the field, still much lower than the financial marginal value of water of Rs 700 per acre foot, the informal market value of Rs 100 to Rs 700 per acre foot, or private tubewell water prices of Rs 100 to Rs 400 per acre foot, but higher than the lower end of informal market prices. To the extent that farmer organizations take over O&M at the distributary level and improve delivery efficiency, these charges would be reduced. Significant efficiency gains below the *mogha* could also be made through farmer organizations.

Pricing of delivery services by public utilities must be regulated to prevent market imperfections leading to discriminatory pricing practices and misstatements of costs in establishing the basis for cost recovery. A commonly used yardstick of financial viability is the potential to earn an acceptable return on assets (such as net operating income) as a fraction of net fixed assets plus working capital (Munasinhge 1988). An upper limit to returns imposes a restriction on average water charges. Regulated in this way the system would give priority to achieving the financial objective of self-sustainability. Possibilities of following more closely the long-run marginal cost pricing approach, that is, charging different blocks of buyers a fixed connection charge and attempting to price the unit of water at its marginal cost while taking into account possible future investment projects, could also be explored.

Regulation to ensure adequate investment in system expansion appears unnecessary. Although the presence of a monopolist utility might appear to imply underinvestment in the water supply, competition from basic water rights holders (totaling about 75 percent of captured water), groundwater, and

other utilities would ensure that appropriate investment was made in the long run. In development of new storage the utility would face competition from federal and provincial governments, other public utilities, and the larger, more advanced farmer organizations. The monopoly of the public utility thus extends only to the delivery of diverted water and regulation should be confined solely to this area.

A New Approach to Administering the System

The future strategy for irrigation and drainage will require a major change in the public sector's approach. The goals of establishing an efficient self-sustaining irrigation and drainage system can be achieved only by promoting the use of market-determined incentives for improving the management of the irrigation and drainage services and giving the private sector a greater stake in the system. The process could begin by decentralizing the management of irrigation and drainage systems by developing commercially oriented public utilities on a canal-command basis, developing suitable farmer organizations around distributaries/minors, formalizing water rights, developing autonomous provincial water authorities, and developing provincial regulatory bodies for regulating public utilities, water rights, and groundwater resources. The structure proposed here approximates the current provincial structure in order to minimize disruption. The functions of the PID would be divided horizontally between the public utilities and a provincial water authority. A provincial regulatory authority would be required for the utilities and user organizations. The role of the federal authorities would remain unchanged.

Public utilities at the canal-command level, which are large enough to capture any scale economies in administration yet small enough to be responsive to users, would play the leading role in the management of the system until user groups matured and were able to take over. Farmer organizations would have to be fostered to provide structure on the demand side. Such organizations would make a unique contribution to the welfare of farmers and to the development of Pakistan's irrigation and drainage by providing a counterbalance to the monopoly of the public utilities, by facilitating water market development, and by reducing administrative and O&M costs.

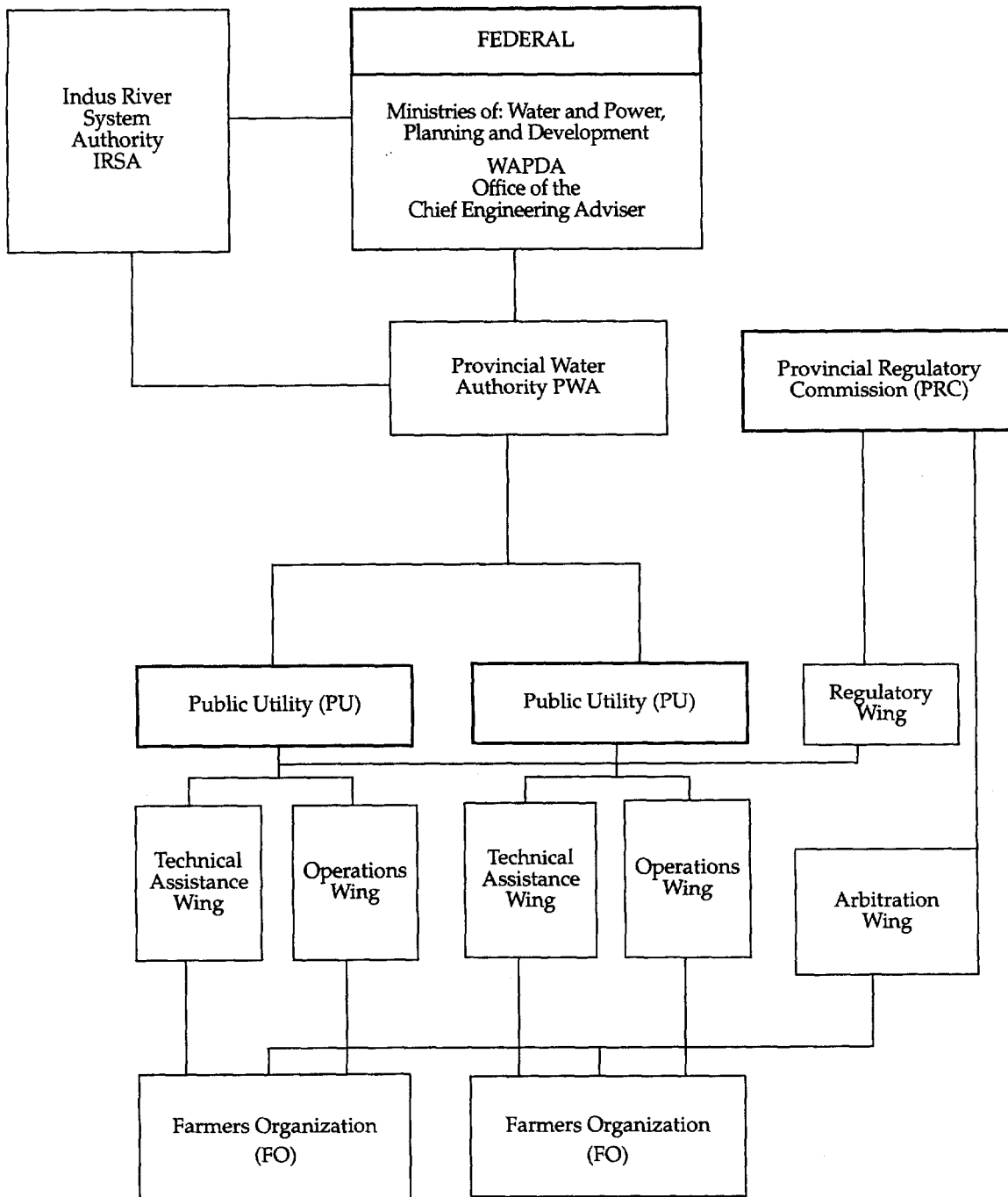
Institutional Structure

The proposed institutional structure provides a greater role for the private sector and autonomy for public sector agencies. Federal institutions would continue to be responsible for overall assessment, coordination, and development of interprovincial water resources and works. An administratively autonomous provincial water authority would be responsible for coordinating all planning and development of water resources within the province and would handle distribution of irrigation water to financially autonomous independent public utilities at the canal command level. At the production phase a farmer organization would distribute water among its members. A provincial regulatory commission would regulate the O&M charges of the public utilities and adjudicate farmers' disputes (figure 5.1).

FEDERAL GOVERNMENT AND AGENCIES. The role of the federal institutions would change only slightly. Development of appropriate legislation to establish water rights, develop water markets, and regulate public utilities would be the responsibility of the Ministry of Water and Power. WAPDA and the chief engineering adviser would continue to work as executive arms of the Ministry of Water and Power and would assume responsibility for the following functions:

- Assessing and allocating water resources among sectors in the light of demand patterns and efficiency in use
- Making hydrological measurements; investigating, planning, and monitoring water above the rim stations; and managing watersheds
- Monitoring and controlling groundwater aquifers

Figure 5.1. Proposed Institutional Structure for Managing of Irrigation and Drainage



Source: Government of Pakistan (1994).

- Developing and implementing criteria and programs for monitoring and enforcing standards for water quality in rivers and groundwater aquifers
- Assessing and forecasting water availability and preparing basinwide operational plans in coordination with the provincial water authorities and public utilities
- Delivering water to the provincial water authorities

- Coordinating flood control works and flood management
- Planning, developing, and operating and maintaining large dams, interprovincial link canals, and outfall drains in response to long-term needs identified by the provincial water authorities or public utilities with full cost recovery for such services
- Recovering O&M and capital costs of federal infrastructure through water charges, sales of water, or revenue installments.

INDUS RIVER SYSTEM AUTHORITY. The Indus River System Authority (IRSA) was created in 1992 to oversee the implementation of the Provincial Water Accord by the provinces. Its role would not change under the new setup. IRSA would lay down the basis for regulation and distribution of surface water among provinces according to the allocation policies agreed to in the Provincial Water Accord, review the reservoir operation, settle any disputes between provinces relating to distribution of river and reservoir waters, and evaluate the availability of water for all new projects.

PROVINCIAL WATER AUTHORITY. An administratively autonomous Provincial Water Authority (akin to the federal WAPDA) would be responsible for delivering water to public utilities. These deliveries might consist of the basic water rights of public utilities and water captured by the provincial water authority, or water traded among different public utilities. Total water use in each province would be determined according to shares allocated under the Provincial Water Accord. The provincial water authority would recover O&M costs for the delivery of the basic rights volume; any incremental water captured by the Provincial Water Authority would be auctioned off.

The Provincial Water Authority would be responsible for the O&M of link canals, barrages, and other provincial facilities distributing water to public utilities (although implementation could be contracted out) and would plan and develop new facilities on behalf of public utilities to improve water delivery efficiency, regulate water within the province, and facilitate sales among public utilities. The cost of these activities would be recovered through the sale of water or revenue installments. Transaction fees would be charged to recover costs involved in facilitating trading among public utilities. The Provincial Water Authority would also be responsible for developing, operating, and maintaining main and tributary drains; receiving drainage effluent from the farmer organizations within the province; and handling flood control and protection works and flood management within the province.

PROVINCIAL REGULATORY COMMISSION. A Provincial Regulatory Commission would oversee the financial affairs of public utilities, register water rights, and adjudicate local water distribution disputes. The commission would comprise two wings. The regulatory wing would oversee the financial aspects of public utilities operations, including reviewing and registering allocation of basic water rights and regulating public utility charges for delivery of basic water rights volumes. All water distribution disputes, including disputes among the members of a farmer organization, would be adjudicated by the arbitration wing.

PUBLIC UTILITIES. Public utilities are a key interim element in the proposed institutional structure. The public utility would need to be a self-sustaining autonomous body with a hard budget constraint. Services would be provided on a commercial basis. The public utility would comprise two wings, operations and technical assistance. Although a public utility could cover several canal commands, for accurate water accounting a canal command could not be split among public utilities. The main function of the operational wing of the public utility would be to take delivery of water from the provincial water authority and to allocate it among farmer organizations. Where contracted to do so by the provincial water authority, it would undertake development, O&M, and collection of charges for drainage and flood protection systems within its command area or elsewhere. The technical assistance wing would be responsible for helping farmers develop farmer organizations and making decisions about technical options. To do so the public utility could hire consulting firms, nongovernmental organizations (NGOs), or other agencies with expertise needed by the farmer organizations. As the farmer organizations matured, the activities of the

technical assistance wing would be scaled down. Revenue of the public utility would come from recovery of O&M costs, including O&M costs charged by WAPDA and the Provincial Water Authority for delivering the water established as a farmer organization's basic right, sale of nonbasic rights water to farmer organizations or other public utilities, and transaction fees for facilitating water trade between different farmer organizations. The public utility would not get involved in disputes among members of the farmer organization as long as the farmer organization paid its water charges. If the farmer organization did not pay its water charges, the public utility would be empowered to stop supplying water.

The major functions of the public utility would include the following:

- Operating and maintaining irrigation and drainage facilities in its command area.
- Collecting water delivery charges from the farmer organizations and collecting drainage service charges as contracted for by the provincial water authority and federal agencies. Drainage costs should also be shared by the industries that dispose their effluent into the drainage system. The cost of flood protection and management should be also shared by all beneficiaries.
- Passing on the provincial and federal share of fees collected to the provincial water authority and federal agencies.
- In coordination with the farmer organization, determining the delivery point at which the farmer organization would receive water from the public utility. During transition, the delivery point may be at the head of a watercourse. As the farmer organizations mature and expand their management capabilities, the delivery point should move higher up the system. The system should have built-in incentives for encouraging greater participation of the farmer organizations in the distribution of water (box 5.4).
- In coordination with the farmer organization, determining basic water rights at the delivery point based on the following criteria:
 - The volume of water based on the approved water allowance at the watercourse head and the designed capacity factor for the distributary would form the lower bound for the water right.⁴
 - The volume estimated, based on an average capacity factor during the post-Tarbela period, would form the upper bound.
 - In determining actual water rights, consideration would be given to soil and groundwater conditions, delivery losses within the farmer organization area, land distribution/ farm size within the farmer organization, and the location of the delivery point.
 - Specific water rights would be negotiated between farmer organizations and public utilities, and approved and registered by the Provincial Regulatory Commission.
 - Groundwater rights would be allocated following allocation of surface water property rights.
 - Water would be procured from the provincial water authority as available (in addition to the basic water rights) for sale to farmer organizations. Excess water would be sold to other public utilities, and trading between farmer organizations would be facilitated for which the public utilities may charge a transaction fee.
 - Field drains in the farmer organizations' areas and drains connecting the areas to the provincial drainage system would be developed and maintained as contracted for by the provincial water authority or the farmer organizations.
 - Commercial investments in system development would be initiated to increase water use efficiency, and fee-based technical assistance would be provided to farmer organizations on O&M of irrigation and drainage systems.

4. At the design stage it is assumed that when operational the distributary will run full, that is, all watercourses on the distributary will draw their authorized water allowances. The capacity factor determines the number of days the distributary will run. The guidelines require the operation of a distributary for a block of time, at least eight days, to ensure that all users on a watercourse receive their share and losses are minimized.

Box 5.4. Cross-Country Experiences with Water Users Associations

User participation in irrigation management is not new; the World Bank has wide experience in this area. Communal irrigation systems in Bali, the Dominican Republic, India, Indonesia, Nepal, the Philippines, Sri Lanka, and Thailand indicate that active farmer involvement in irrigation is very cost-effective in mobilizing local resources, improving and maintaining activities, reducing irrigation department staff time, limiting damage to facilities, increasing fee and fine collection, resolving disputes, and facilitating extension and farmer training (U.N. Food and Agricultural Organization 1982). Recognition of these benefits, and the realization that many of the performance problems in Pakistan's irrigation system were brought on by failures of government institutions, led to a marked increase in the development of user associations in Pakistan since the 1970s (Mase 1990). Developing country experiences with water user associations vary considerably, but successful indigenous system development reveals a common pattern: successful user associations develop simultaneously with the planning, constructing, and expansion or creation of the physical system, often over a period of many years (Walker and Cleveringa 1989).

One of the most successful government efforts to promote user participation in irrigation management is in the Philippines, where more than 5,600 communal irrigation schemes cover almost half of the irrigated land. Farmers there handle O&M and operate on a self-financing basis, with technical assistance provided by a network of irrigation community organizers.

In Indonesia the government sought to turn over small irrigation systems to water user associations when underfinancing of O&M began to threaten system sustainability. Since 1987 the government has transferred more than 400 systems, covering more than 34,000 hectares, to water user associations. Success of the program is attributed to the early inclusion of farmers in the design and creation of the user associations.

In Nepal 70 percent of all irrigation is now under farmer control. Expansion of the system in recent years has been helped by a World Bank-financed Irrigation Line of Credit Pilot Project. The project extends credit to water user associations that contribute to capital costs for construction of new subsystems and take over O&M.

In the Dominican Republic management of irrigation and drainage systems has been transferred to water user associations in two project areas, Azua (YSURA) and Santiago (PYRN Contract I), which cover a total area of 14,400 hectares serving 6,000 farm families. A water user group (Nucleos) was formed on each sublateral. Distribution of irrigation water is controlled by Nucleos after it leaves the lateral canal. The Nucleos on an irrigation lateral subsequently formed a water user association (Junta) that encompassed a complete lateral. Cost recovery and O&M of the system has improved significantly since the water user associations took over.

Interest in (and new approaches to) farmer-managed irrigation schemes has grown in Latin America as well. In Mexico O&M of the irrigation system has improved markedly and about 80 percent of O&M costs have been recovered since the 1989-94 National Development Plan adopted a policy of transferring management responsibilities to water users. In Argentina traditional user organizations, whose members held a total of 100 to 500 hectares, were found to be too small to meet the associated costs. Maintenance was insufficient, water management was weak, and head enders benefited disproportionately. To capture economies of scale these small associations merged into larger ones, representing 5,000 to 15,000 hectares. Twenty-one new organizations were formed covering 200,000 hectares. Each organization is autonomous, finances its own expenditures, issues its own regulations in accordance with the newly enacted water law, and hires professional managers to take charge of such tasks as water delivery, cost recovery, and maintenance. Not only are administrative costs lower, but the larger organizations have increased conveyance efficiency by 10 percent.

DRAINAGE AND FLOOD PROTECTION. Because drainage is a public good, the primary responsibility for provision and O&M of drainage and flood protection services rests with the public sector at both the federal and provincial level. The delivery agency (the public utility) has the opportunity to play a unique role, but steps will have to be taken to avoid unnecessary monopolies.

A three-tier drainage system is proposed. Responsibility for interprovincial drains and flood protection would remain with the federal authorities. The Provincial Water Authority would be responsible for development and O&M of provincial drainage and flood protection. As monopoly suppliers of canal water, public utilities have a unique ability to collect drainage cost recovery charges on behalf of the provincial water authority together with irrigation water charges. The provincial water authority could also contract with public utilities to carry out drainage O&M within their own canal command area. To preserve competition,

however, all provincial water authority contracts for drainage construction, contract management, and O&M should be awarded through competitive bidding. Farmer organizations may develop local area drainage schemes through contracts with public utilities or private contractors. Farmer and other user organizations may internalize collection of drainage charges or use the utilities' collection facilities.

An optional two-tiered system would charge the public utilities with responsibility for providing all off-farm drainage needs and recovering costs, which could be tied to irrigation water charges. Such charges would come under the regulatory oversight of the Provincial Regulatory Commission. The Provincial Water Authority would likely remain responsible for overall planning and coordination of provincial drainage development in addition to its other responsibilities.

FARMER ORGANIZATIONS. If Pakistan's farmers have managed their own watercourses for decades without formally organizing, why should they do so now? Pakistan's irrigation system was built to serve fewer farmers holding larger acreage than they do today. Migration and land fragmentation have put great pressure on already scarce water resources (Government of Pakistan 1988b). In the process discipline has broken down, theft has become increasingly common, and inequity has grown (Bandargoda and Firdousi 1992). Real O&M expenditures have fallen markedly over the past few decades so that less water now reaches the *mogha*. Flows through watercourses are subject to leakage and theft, and water reaching the tail (when it does so at all) is inadequate. Given the government's fiscal constraints, an alternative O&M financing strategy must be pursued. The preferred course is to transfer greater control of the irrigation system to organizations of water users. Because traditional methods of decisionmaking among irrigators have not proved to be sufficient to shoulder these new responsibilities, cooperation among users (not just within but among farmer organizations) will be required to transfer greater O&M control from the government and to enable water markets to function effectively.

To realize the full potential of water markets, maximum flexibility and control must be afforded to the buyers and sellers of water. Farmers could arrange the sale of water among individual users located at the lower end of the system, something that would be prohibitively expensive for a public agency to do. Formation of farmer organizations, initially at the distributary/minor level, would reduce the O&M burden of the public sector, enhance farmer participation in the distribution of water, and provide a market in which the true value of water would be transparent. The farmer organizations would likely be cooperatives and thus subject to oversight and regulation by provincial government agencies responsible for cooperatives. In most provinces specialized enabling legislation would be required before such organizations could be established.

Ensuring accountability of monopolies (public or private) is crucial and is best achieved through a combination of regulation (service standards, reporting requirements, and so forth) and consumer rights. Consumers, acting collectively and individually to protect their rights, and reinforced by legislation, help ensure accountability. Farmer organizations must play a central role in ensuring that public utilities are accountable for service delivery, maintenance of physical structures, and assessment of charges.

Farmer organizations must also help bring user discipline to water distribution. The fact that *warabandi* on a watercourse, which is implemented by the farmers themselves, is rarely violated shows that the farmer organizations can improve operation of the system. Their role should thus be expanded to the highest possible level in the system, at least to the distributaries and minors.

In the short term, the main functions of a farmer organization should include the following:

- Determining a suitable delivery point from which to receive supplies from the public utility, assess basic water rights, and determine the share of each farmer organization member
- Distributing water and facilitating trade of water among members
- Estimating and forecasting water needs for the farmer organization area and negotiating with the public utility to acquire incremental water or arrange sale of excess water to another farmer organization or public utility
- Carrying out O&M of both the irrigation and the drainage systems within the farmer organization area

- Planning and developing the irrigation and drainage system within the farmer organization area by improving the distributary/minor, setting up control structures to make the system flexible for trading among farmer organization members, installing meter flumes or other suitable water measuring devices for water accounting, redesigning watercourses and their layout, and/or laying out farm land, on-farm drainage, and connections to the public utilities drainage system
- Developing groundwater to meet water needs
- Estimating total O&M cost, including public utility charges, collection of water charges or other fees from its members, and payments to the public utility.

In the long term farmer organizations would play a larger role. Development of farmer organizations in Pakistan is currently inadequate to support operation of more than a watercourse; even at this level, despite substantial effort by the World Bank, results have fallen short of expectations. Because of the underdevelopment of farmer organizations, public utilities will have to play the leading role in the short run. The interim role of the public utilities should not impede eventual takeover by the farmer organizations and other local groups with valid interests in area water resource management. As the farmer organizations expand from the watercourse level, through amalgamation at the distributary and minor levels and through a federation to the entire canal command, they are expected to become more involved in the work of the public utility through greater representation on its board. Eventually, formation of long-run business policy should be well within the capabilities of the farmer organization, and the farmer organization federation would be expected to try to rationalize other productivity-related agricultural matters, such as land consolidation and technology transfer.

Transition Arrangements

The total period required for transition depends on the acceptance of the new institutional structure and the speed with which farmer organizations are developed. Total transition is expected to take about 15 years, with completion of all four phases expected within 20 years. The structure outlined here will require adjustments to suit the specific conditions at the different canal-command areas. A phased approach is therefore desirable, as shown in table 5.4.

PHASE I: FORMATION OF INSTITUTIONS. The first step is to develop legislation and issue administrative orders and notifications allowing formation of public utilities, farmer organizations, water property rights, and water markets. The next step is to define the structure of a public utility and the provincial regulation commission. Because the new institutional structure may be readily introduced through a series of development projects, it is very important to establish a link between it and the Annual Development Program. The transition will start by selecting one of 43 canal commands of IBIS as a pilot project under the annual development program. Allocations in the Eighth Five-Year Plan for the Irrigation System Rehabilitation Program, On-Farm Water Management Program, and drainage were used to establish the new institutional structure in the selected area.

After the public utility is established, control of irrigation and drainage in the project area would be transferred to the public utility. During transition the old and new systems would run in parallel, with built-in incentives to move toward the new system (box 5.5). Selection of the project and formation of the public utility would be announced to the farmers, who would be encouraged to form farmer organizations. In the beginning considerable assistance would be required to help farmers form farmer organizations and to prepare them for taking over responsibilities. These services could be provided through consulting firms or NGOs; the technical assistance wing of the public utility could assist in arranging such services. In areas in which the farmer organizations are ready for handling bulk water deliveries from the public utility on a volumetric basis, deliveries would be switched over to the new system. In the rest of the area the current system would continue with revised crop-based charges to recover full O&M costs.

The public utility would prepare a water budget and distribution schedule for the command. It would define new rules of *warabandi*, which would include watercourse losses in determining time allocation for each farmer. Farmers on a watercourse could continue with the *kacha warabandi* (mutually agreed rotational schedule for irrigation deliveries on a watercourse). However, if a dispute arose the public utility would intervene in that watercourse command and fix new *pakka warabandi* (a fixed rotational schedule of irrigation deliveries), which would account for losses in the watercourses. The public utility would not be responsible for enforcing the *warabandi*. If a dispute arose the arbitration wing of the provincial regulation commission would adjudicate and its decision would be final. Users who did not pay water charges would be excluded from the *warabandi*; if nonpayment continued, outlets would be closed.

The public utility would estimate O&M costs and establish water charges using the current system (by crop) and these charges would be approved by the regulatory commission. If the government wished to phase increases in the public utility's water charges, the difference would have to be met by the government. To recover O&M cost from a farmer organization area, the public utility would determine the O&M cost of delivering water at different points in the system and develop a volume-based rate structure, which would be approved by the provincial regulatory commission.

After a farmer organization is formed, the public utility would work with it to determine an appropriate delivery point. This point should have a control structure for regulating and measuring flows. If such a structure does not exist, the public utility would provide it. Based on the guidelines approved by the provincial regulatory commission, the public utility and farmer organization would estimate basic water rights at the delivery point. The volume, timing, and O&M cost for delivering these basic water rights would then be approved by the provincial regulatory commission.

PHASE II: INSTITUTION BUILDING. As the farmer organizations are formed and the water balance in the command area changes, the public utility would update its water budget. In addition, the public utility

Table 5.4. *Phasing in the Restructuring the Irrigation and Drainage System*

<i>Phase</i>	<i>Restructuring steps</i>	<i>Responsibility for O&M</i>	<i>Assessment of water charges</i>	<i>Collection of water charges</i>
Phase I: Formation of Institutions Period 1-2 Years	Enabling legislation, allowing formation of public utilities, farmer organizations, sales of water, establishing water rights and revision of <i>warabandi</i> to include delivery losses. Linkage of the Annual Development Program with the commercialization of Irrigation and Drainage systems (I&D). A pilot public utility is formed converting at least one canal command. At the same time the Provincial Regulatory Commission (PRC) is formed. Public utility announces the revised rules of <i>warabandi</i> in the project area. Formation of farmer organizations is encouraged, and the technical assistance wing of public utility assists farmer organizations in organizing and making technical decisions.	As currently (i.e., farmers below <i>mogha</i> and public utility above <i>mogha</i>).	Water rates are crop based but revised to recover full O&M cost of public utility.	By public utility either directly from farmers or from functioning farmer organization.

(table continues on following page)

(Table 5.4 continued)

Phase	Restructuring steps	Responsibility for O&M	Assessment of water charges	Collection of water charges
Phase II: Institution Building Period 2-3 years	Farmer organizations are formed, water rights of the farmer organizations are determined jointly by the farmer organization and public utility, and approved and registered by the Provincial Regulatory Commission. To expedite formation of farmer organizations, incentive packages and technical assistance will be offered to potential farmer organizations. In the farmer organization areas, the system is remodeled wherever necessary, and water is delivered to the farmer organizations on volumetric basis at the delivery point. Total deliveries will consist of water rights and purchases from public utility or other farmer organizations. In nonfarmer organization areas the public utility will revise the <i>warabandi</i> if a dispute arises. Technical wing of public utility provides assistance in installation of control structures and measuring devices within its area.	Farmer organization is responsible for O&M of the system below the delivery point, public utility above. In nonfarmer organization areas farmers are responsible for O&M below <i>mogha</i> and public utility above <i>mogha</i> .	O&M cost estimated on volumetric basis for the water delivered as water rights, and incremental water is delivered at the negotiated price. For water trade among farmer organizations the public utility will charge a delivery fee. In nonfarmer organization areas, water charges are crop based.	Public utility collects charges from farmer organizations where they are formed and from farmers in nonfarmer organization areas.
Phase III: Development and Expansion Period 3-4 years	Public utility improves delivery efficiency and expands the water supply. Drainage needs are assessed, and drainage network developed if farmer organizations agree.	Same as above.	Same as above.	Same as above.
Phase IV: Final Phase Period about 10 years	Rest of the canal commands are converted to public utilities and PWAs are formed.	Same as above.	Same as above.	Same as above.

Source: Government of Pakistan (1994).

would assess water losses in the channels under its control and develop plans to recover those losses. Improvement plans would be examined by the provincial regulatory commission, especially in the fresh groundwater areas to determine the extent of the incremental water. The provincial regulatory commission could use the technical services of agencies such as WAPDA for this purpose. Improvements would also be needed to develop operational flexibility and to provide water accounting necessary for efficient operation of the system. At the pilot stage the public utility would require expert technical assistance to design replicable models. As the system developed, the public utility could sell any excess water to farmer organizations or to other public utilities; to meet the demands of farmer

Box 5.5. Incentives for Moving to the New Farmer-Managed System

Several incentives encourage farmers to switch to the new system. The new system guarantees reliable supply of a minimum amount of water determined as the basic right for the farmer organization area and offers the possibility of acquiring more water through purchases. At the mature stage of the system most farmer organizations would be able to plan ahead for such purchases. Knowing in advance with reasonable certainty the total amount of water available would allow farmers to do advance crop planning and to coordinate the application of nonwater inputs. Water charges would be lower than under the old system because part of the O&M would be carried out by the farmers more efficiently. More than 20 percent of the losses occur in the distributaries and minors and about 60 percent in watercourse commands. Recovery of these losses by the farmer organizations would expand their water supply considerably, especially in saline areas. The farmer organizations would receive assistance from the public utility and the government in improving their system. The new system would also allow farmers to manage their own affairs, adopt a distribution pattern they prefer, and generate greater output and income.

organizations, public utilities could purchase water from other public utilities or the provincial water authority when they are formed at a later stage.

Different development alternatives for the pilot should be evaluated and designed as part of the project preparation and the public utility should be assisted in designing suitable controls to make the system flexible. The complexity of the problem and the importance of arriving at the best solution make development of the pilot critical. A water measuring and accounting system for the project area should also be designed and consultants should assist in preliminary designs for modifying the distributaries and minors that are transferred to farmer organizations. These designs should be finalized and implemented in consultation with the farmer organizations. Drainage needs for the area should also be assessed and an overall plan prepared.

The technical assistance wing of the public utility should be assigned to work with farmers on a distributary/minor to explain the new system and to assist them in forming farmer organizations. Farmers would elect representatives, register the farmer organization, and establish an office and a bank account. With assistance from public utilities, technical assistance teams, and project consultants, the farmer organization would assess the suitability of existing structures and identify the structural improvements, such as watercourse improvement, control structures, canal improvement, and measuring devices, required to distribute water efficiently. Assisted by consultants, the farmer organization would prepare plans for the development and financing of these improvements.

In areas without farmer organizations the current system of distribution of water would continue, except these areas would receive water from the public utility rather than the PIDs. Water rates would be revised to recover total O&M costs. In the event of a water distribution conflict, a revised *warabandi* that would include delivery losses would be implemented.

During transition incentive packages would be offered to encourage farmer participation and speed the development of the public utility. Costs of such assistance would be fully recovered after a grace period. For the public utility, technical assistance would be needed in the form of consulting services, establishment of offices, and improving structures. For farmer organizations the incentive package may consist of technical assistance and office establishment to be provided from the development budget. On-farm improvements (such as lining the watercourses, providing flow control and measuring devices, and improving on-farm drainage) could also be financed from the development budget. These would, however, be fully recovered in the form of cash advances, labor contribution, water charges, or revenue installments. The farmer organizations would also contribute toward improvements above the *mogha*. The recovery level from farmer organizations would be determined on the basis of types of improvements provided, reduction in O&M cost of the public utility as a result of transfer of these facilities, and the paying capacity of the farmer organizations.

PHASE III: DEVELOPMENT AND EXPANSION. Development and expansion (Phase III) would proceed simultaneously with Phase II. The public utility would improve delivery efficiency and expand the water supply by reducing excessive losses, remodeling the delivery system, and developing storage and groundwater. If most of the farmer organizations agreed, the public utility would plan and develop the drainage system and arrange for the disposal of drainage effluent.

PHASE IV: FINAL PHASE. This phase of the restructuring would involve development of public utilities in the remainder of the canal commands. Lessons learned from the pilot project would be incorporated during the transition of the rest of the area to the new structure. The provincial water authority would be formed after several public utilities began functioning.

BOTTOM-UP VERSUS TOP-DOWN APPROACH TO RESTRUCTURING. The current institutions could be transformed into the proposed structure in two ways. A bottom-up approach would establish a series of pilot projects at the canal-command level in which public utilities and farmer organizations would take over O&M functions of the irrigation and drainage system. Changes at the provincial level would be made after the new institutional structure began functioning satisfactorily in a few canal commands.

A top-down approach would establish the provincial institutions, the provincial water authority and the provincial regulatory commission, first, and only then set up the public utilities and farmer organizations at the canal-command level. This approach might bring some efficiency at the top and could speed up transition. The first option is superior, however, because it minimizes overall disruption by limiting its scope to pilot areas, leaving the rest of the system to function as it currently does; allows the system turnover methodology to be improved upon as the transition proceeds (this experience will also be useful in designing the top-level institutions); and allows time to reorient and train institutions so that they do not become bloated replicas of the old ones.

6

Improving Rural Finance

Saeed Qureshi, Ijaz Nabi, and Rashid Faruquee

The availability of adequate rural credit is central to improving economic growth and alleviating poverty in Pakistan. In 1995, 24 million of Pakistan's total workforce of 34 million (71 percent) worked in rural jobs, with 64 percent employed in agriculture, 12 percent in services, and 24 percent in rural manufacturing, construction, and trade. Each of these subsectors has credit needs to which the rural finance system must respond.

Easy availability of credit encourages farmers to switch to new technologies more readily, thus allowing them to achieve more rapid productivity growth. But small farm size and tenancy arrangements that prevent farmers from being able to put up collateral can block access to credit, retarding productivity growth. Poor access to credit results in large yield gaps between progressive (typically medium-size) farmers and laggards (typically small owner-cultivators and tenants). The most important objective of rural finance must therefore be to facilitate farmers' access to inputs and improved technology, thus allowing farmers to increase productivity, the key to sustaining future growth in agriculture in Pakistan.

The rural financial system in Pakistan must also address the special needs of the disproportionately large number of poor households in rural areas. Policy-directed lending to the poor is justified because of the market's failure to correctly assess and manage the risk of lending to the poor, who may not be able to satisfy the collateral requirements grounded in individual property rights.¹ By spreading risk and appealing to social responsibility for contract enforcement, policy-directed credit based on group lending results in better management of risk and renders the poor more creditworthy.

According to the 1987/88 *Household Income and Expenditure Survey* (Government of Pakistan 1988a), 85.8 percent of the country's population in poverty live in rural areas. This finding is consistent with a more recent finding that household income in rural areas is 35 percent lower than income in urban areas. The poor are found among small cultivators (owner-cultivators on marginal lands and tenants), landless agricultural workers, small livestock owners, and nonfarm workers. Rural finance directed at these households must be affordable and sustainable and it must reach the truly needy.

The credit needs of rural women also require attention. Employment opportunities for women in Pakistan are greater in rural areas, where women constitute 6 percent of the workforce, than they are in urban areas, where they constitute only 2 percent of the workforce. Rural women represent an important source of income and the rural finance system should ensure that they have adequate access to credit. The large community of nonfarm rural households engaged in microenterprises also has inadequate access to credit and substantial credit needs. Given this sector's contribution to overall economic growth and employment generation, credit should be made available.

The development of a rural credit market in Pakistan has been "considerably distorted" (Mellor 1995). The result is a fragmented credit market that varies in development and density by region (Malik 1993). The system should be reformed to meet the following criteria:

1. It has been argued that when market imperfections exist, lenders face the problem of managing the risk of loan default (World Bank 1992a). Some view credit as a process of intermediation rather than as a production input and argue for improving this process through the market mechanism (Adams, Graham, and Von Pischke 1984). Neither financial intermediation nor higher interest rates will resolve the problems of asymmetric information and imperfect enforcement that prevail in developing countries, however (Hoff and Stiglitz 1990).

- Access to credit should be unhampered by policy or market failures that restrict productivity growth in agriculture. Where small farmers constitute the bulk of the farming community, as they do in Pakistan, institutions need to be created that overcome market failure resulting from the high risk and high transaction costs associated with lending to such farmers.
- Credit should be available to the rural poor for consumption smoothing as well as for promoting sustainable income-generating activities.
- Policy interventions that create special lending institutions to meet the first two objectives should be subject to conditions, including adequate recovery of loans, market interest rates, and mobilization of deposits, that ensure financial survivability by reducing and ultimately eliminating their dependency on subsidies.
- When scarce credit is targeted at special groups of farmers or the rural poor, transparent criteria should be established to evaluate target performance continuously.
- Credit should be made available for nonagricultural rural activities, such as microenterprises in rural manufacturing.

The Rural Credit Profile

A detailed profile of the rural financial market, based on rural credit surveys, helps to identify its strengths and weaknesses. The last comprehensive rural credit survey was undertaken in 1985. Other assessments based on smaller samples have broadly corroborated the conclusions of the 1985 survey. The most recent of these assessments is the survey carried out by the International Food Policy Research Institute (IFPRI) with U.S. Agency for International Development (USAID) funding. IFPRI conducted several rounds of interviews with rural households in selected districts to elicit information on rural consumption, production, and employment patterns. Although the sample was relatively small, and not randomly drawn, the survey findings provide many useful insights into the rural credit market in Pakistan.²

Six dimensions of the credit profile that are relevant to policy are examined here: (a) the importance of rural credit to agricultural performance, (b) coverage of farmers by the rural credit system, (c) cost differences between institutional and noninstitutional credit sources with respect to costs, (d) differences between institutional and noninstitutional credit sources, (e) differences in access to credit sources by rich and poor households, and (f) lending practices of different sources that affect household access.

Rural Credit Is Critical to Increasing Agricultural Productivity

The importance of farm credit to agricultural productivity growth is well established in many countries. Two recent studies in Pakistan corroborate these results. Malik, Mushtaq, and Gill (1991) examined the relationship between the log of farm output and the log of institutional credit using household level data from the 1985 *Rural Credit Survey* (Pakistan Agriculture Census Commission 1985). They estimate a coefficient value of 0.15 that is statistically significant at the 99 percent level of confidence. Using more aggregate data Zubeiri (1989) found no statistically significant correlation between farm output and institutional credit but did find a statistically significant relationship between credit and purchase of inputs such as seeds and fertilizer. These inputs, in turn, were found to be significantly correlated with productivity growth.

The rural credit survey carried out by IFPRI also provides direct evidence of the differences between input expenditures of farmers with and without access to rural credit. Table 6.1 shows that all farmers, regardless of asset size, who have access to rural credit spend more on farm inputs than do farmers who do not have access to credit: on average, input expenditure by farmers with access to credit is 37 percent higher than expenditures by farmers without access to credit.

2. This discussion is adapted from von Braun, Malik, and Zeller (1993).

Table 6.1. *Input Expenditures for Households with and without Access to Credit by Asset Quintiles*
(dollars per hectare)

Category	Lowest	Second	Third	Fourth	Highest	Overall
Households without access to credit	48.17 (5.51)	45.10 (3.65)	48.02 (3.13)	55.12 (3.64)	67.62 (4.57)	53.30 (1.80)
Households with access to credit	59.08 (3.05)	66.34 (8.23)	61.36 (6.19)	81.33 (8.69)	112.69 (13.76)	72.84 (3.45)
T-test	-1.72 ^b	-2.70 ^a	-2.12 ^a	-3.29 ^a	-3.76 ^a	-45.43 ^a
Number of households	216	219	218	216	211	1,080

Notes: Dollar expenditures per hectare are computed using an exchange rate of US\$1 = Rs. 21.28.

Figures in parenthesis represent standard errors of respective means.

a. Statistically significant at the 5 percent level.

b. Statistically significant at the 10 percent level.

Source: IFPRI, *Pakistan Panel Survey*, Round 13, 1990, cited in von Braun, Malik, and Zeller (1993).

Coverage of Farmers by the Rural Credit System Is Inadequate

Despite the importance of credit in increasing agricultural productivity, few rural households are able to obtain credit. A striking finding of the *Rural Credit Survey* is that institutional sources (the Agricultural Development Bank of Pakistan [ADBP], commercial banks, and cooperatives) provide credit to only a small proportion of rural households. Of the 9.24 million rural households in Pakistan in 1985, 5.18 million of which were farming households and 4.05 million of which were nonfarm households, only 32 percent (2.95 million) reported taking loans and only 27 percent reported outstanding debt. Of households that borrowed, a mere 10 percent (240,000 households) borrowed from institutional sources (76 percent from the ADBP, 17 percent from commercial banks, and 6 percent from cooperative societies). The remaining households borrowed from noninstitutional informal sources (67 percent from friends and relatives, 11 percent from landlords, 2 percent from factories, and 2 percent from moneylenders). The total outstanding debt of all farm households at the time of the 1985 survey was Rs 25,076 million, of which 32 percent was owed to formal institutions. The average debt per household owed to institutional sources was Rs 32,955, nearly 4.5 times more than the average debt of Rs 7,390 owed to noninstitutional sources. Comparison with selected Asian countries shows that the percentage of farm household loans from institutional sources was higher in India, the Philippines, and Thailand than it was in Pakistan (Mellor 1995).

Noninstitutional Credit Predominates Despite Higher Costs

Although the share of noninstitutional credit declined in recent years—from 89 percent of total rural credit in 1973 to 62 percent in 1990—it remains the predominant mode of rural finance (table 6.2), a pattern that is found in many other Asian countries (table 6.3). The IFPRI survey reveals that the cost of credit varies significantly depending on the credit source (table 6.4). The average interest rate charged by formal sources in 1990

Table 6.2. *Provision of Rural Credit Provided by Institutional and Noninstitutional Sources in Pakistan, Selected Years*
(percentage of total farm credit)

Year	Institutional sources	Noninstitutional sources
1973	11	89
1985	27	73
1990	38	62

Source: Pakistan Agriculture Census Commission (1973, 1985); Government of Pakistan, *Agricultural Census*, 1990.

Table 6.3. *Share of Informal Rural Credit in Selected Asian Countries*
(percent)

<i>Country (reporting year)</i>	<i>Informal credit share</i>
Republic of Korea (1981)	50
Indonesia (1985)	52
Thailand (1985)	52
Malaysia (1986)	62
Bangladesh (1974)	63
India (1972)	70
Philippines (1978)	71
Pakistan (1985) ^a	73

a. Data for Pakistan are from the 1985 *Rural Credit Survey*.

The 1990 Agricultural Census reports informal credit at 62 percent.

Source: Ghate (1992).

Table 6.4. *Interest Rates Charged by Type of Lender, 1990*
(percent)

<i>Asset quintile</i>	<i>Institutional sources</i>		<i>Friends and relatives</i>		<i>Noninstitutional informal sources</i>		<i>Other</i>	
	<i>Mean interest rate</i>	<i>Share of total loans</i>	<i>Mean interest rate</i>	<i>Share of total loans</i>	<i>Mean interest rate</i>	<i>Share of total loans</i>	<i>Mean interest rate</i>	<i>Share of total loans</i>
Lowest	11.1	66.7	10.0	0.5	30.0	0.2	10.7	0.5
Second	11.5	53.8	20.0	0.4	24.8	1.0	13.9	1.8
Third	11.9	73.9	0.0	0.0	18.0	0.3	12.0	3.1
Fourth	12.6	73.1	0.0	0.0	57.2	0.7	13.0	7.8
Highest	12.9	81.9	0.0	0.0	31.3	1.5	13.1	19.1
All groups	12.8	76.8	14.3	0.2	32.9	0.7	13.0	5.7

Source: IFPRI, *Pakistan Panel Survey*, Round 13, 1990, cited in von Braun, Malik, and Zeller (1993).

was 12.8 percent, significantly lower than the 14.3 percent charged by friends and relatives. The average rate charged by informal sources other than friends and relatives was 33 percent. Little variation was found in the rate paid by rich and poor borrowers, suggesting that neither formal nor informal sources vary their rate according to the assets owned by borrowers but assess the level of risk based on other criteria.

Institutional and Noninstitutional Credit Sources Serve Different Needs

Most institutional credit in Pakistan (94 percent) is used for agricultural production and investment (table 6.5). Nearly half of noninstitutional credit (47 percent) is used for consumption. Demand for nonfarm business credit remains unsatisfied, according to the 1985 *Rural Credit Survey*. Projecting their future credit requirements, borrowers estimated that their credit requirement for farm activities would constitute 56 percent of total need, their requirement for direct consumption 24 percent, and their requirement for credit to finance nonfarm business investments 20 percent.

The duration of credit from different sources reported in the 1985 survey is presented in table 6.6. Both institutional and noninstitutional credit sources lend primarily to short-term borrowers; only institutional sources engage in significant medium- and long-term lending.

Table 6.5. Institutional and Noninstitutional Borrowing by Purpose of Loan, 1985
(percentage of total borrowing)

Source of loan	Agricultural production and investment	Agriculture nonfarm business	Business	Consumption
Institutional	94	2	0	3
Noninstitutional	39	3	10	47

Note: Figures do not add up to 100 because of rounding.

Source: Pakistan Agriculture Census Commission (1985).

Table 6.6. Distribution of Loans by Term
(percentage of total)

Source of loan	Short term	Medium term	Long term
<i>By number of borrowers</i>			
Institutional	78	10	11
Noninstitutional	96	4	—
<i>By loan amount</i>			
Institutional	32	16	52
Noninstitutional	90	9	—

— Not available.

Note: Figures do not add up to 100 because of rounding.

Source: Pakistan Agriculture Census Commission (1985).

Poorer Households Depend Mainly on Expensive Noninstitutional Sources

The IFPRI survey confirms that credit is important to all rural households: 57 percent of the households surveyed use credit, which financed 17 percent of household expenditure on farm inputs, farm capital, and consumption. Not surprisingly, there is an inverse correlation between household wealth and credit use (table 6.7). Thirty-three percent of expenditures by poor households are financed through credit, compared with 11 percent for richer households. This pattern is observed regardless of whether credit is used for the purchase of inputs or capital assets or to finance consumption.

Poor households rely mainly on more expensive informal credit sources: only 1 percent of their total credit comes from formal sources (table 6.8). Richer households, by contrast, obtain most of their credit (58 percent) from formal sources. Rich farmers' superior access to institutional sources is also corroborated by the 1985 *Rural Credit Survey*, which shows that the major share of credit within the crop sector is preempted by large farmers. About 60 percent of small and subsistence farmers do not borrow at all. Of those who borrow, 90 percent have recourse only to the informal market. Because of the enormous expansion of credit availability since 1973, there has been some improvement in smallholders' access to institutional credit. The evidence is distorted, however, by the abuses associated with interest-free loans from 1979 to 1988, when loans were generally obtained by large farmers, who either used the names of smallholders or understated the size of their own holdings.

Poor Households' Access to Institutional Finance Is Constrained by Complex Procedures and Lack of Transparency

Table 6.9 compares the principal lending practices of institutional and noninstitutional sources of credit and shows that noninstitutional sources have much simpler, more flexible procedures than do institutional

Table 6.7. *Proportion of Expenditure Met through Credit, by Asset Quintiles and Use of Credit* (percent)

Asset quintile	Proportion of expenditure met by credit				Credit-using households as a percentage of total households
	Input	Capital	Consumption, including food	Total	
Lowest	47.65 (39.89)	37.33 (4.53)	31.86 (54.96)	32.89 (100.00)	58.67
Second	30.90 (22.75)	65.21 (26.65)	30.09 (50.59)	27.88 (100.00)	54.19
Third	17.16 (13.86)	44.90 (27.53)	24.37 (53.98)	21.05 (95.37)	58.25
Fourth	12.56 (18.37)	10.56 (13.33)	21.17 (68.30)	12.65 (100.00)	58.80
Highest	17.61 (37.41)	14.30 (23.39)	14.88 (39.20)	10.74 (100.00)	55.52
All households	22.15 (27.67)	23.34 (19.78)	22.70 (51.57)	17.02 (100.00)	57.05 ^a

Note: Figures in parentheses represent percentage shares of credit used for each category out of the total credit.

a. This sample of households differs from the households covered in the 1985 Rural Credit Survey.

Source: IFPRI, *Pakistan Panel Survey*, Round 13, 1990, cited in von Braun, Malik, and Zeller (1993).

Table 6.8. *Source of Loans by Asset Quintile* (percent)

Asset quintile	Institutional		Noninstitutional			
	Formal sources	Number of loans	Friends and relatives	Number of loans	Other informal sources	Number of loans
Lowest	1.05	3	31.43	201	67.51	585
Second	4.83	13	49.53	249	45.63	396
Third	12.60	23	48.33	244	39.17	308
Fourth	29.62	52	35.44	174	35.05	285
Highest	58.46	116	20.10	139	21.54	263
All households	32.26	207	32.49	1,007	35.55	1,837

Note: Figures do not add up to 100 because of rounding.

Source: IFPRI, *Pakistan Panel Survey*, Round 13, 1990, cited in von Braun, Malik, and Zeller (1993).

sources. As much as 76 percent of institutional credit was lent against the security of landed property, with 21 percent backed by personal surety. In contrast, 96 percent of the borrowing in the noninstitutional market was backed by personal surety, 2 percent by land, and 1 percent by agricultural produce. Despite the best efforts of policymakers and success stories from other systems operating on personal or group guarantee (such as Grameen Bank in Bangladesh), institutional credit continues to rely on land mortgage. The informal market advanced Rs 19.7 billion on personal surety, with institutions advancing only Rs 1.7 billion. The informal market thus provided 11 times more coverage than did the institutional credit system.

Rural Credit Requirement and Credit Delivery

The demand for rural credit stems from agricultural production (investment and production credit); consumption smoothing, especially by poor households (consumption credit); and the investment needs

Table 6.9. *A Comparison of Institutional and Noninstitutional Credit Markets, 1984/85*

Category	Institutional market	Noninstitutional market
Number of borrowers	400,000	2 million
Total credit	Rs 18 billion	Rs 33.4 billion
Principal players	Agriculture Development Bank of Pakistan, 55.0%; commercial banks, 29.4%; cooperatives, 15.0%	Friends and relatives, 58.0%; marketing intermediaries, 16.0%; landlords, 8.1%; moneylenders, 2.4%; factories, 4.8%
Average interest rate (1973)	Mean 8.16%; SD 1.82	Mean 15.43%; SD 11.63
Source of funds	ADBP: State Bank of Pakistan and foreign sources, 87.0%; equity and retained earnings, 12.0%; deposits, 1.0% Commercial banks: deposits, 92.0% Cooperatives: SBP, 78.0%; deposits, 18.0%; equity and retained earnings, 4.0%	Mainly own funds
Collateral requirement	Stringent, with complex procedures	None
Flexibility	Regulated terms	Very flexible terms
Subsidy	ADBP subsidy at 32%	None
Loan recovery	Below 50%	Excellent
Cost of credit delivery	9.1% for ADBP	Negligible transaction costs

SD Standard deviation.

Source: Pakistan Agriculture Census Commission (1985).

of rural households engaged in livestock rearing and microenterprises. This demand is met by institutional and noninstitutional sources, each of which is examined here.

Institutional Sources of Rural Credit

The role of institutional credit can be assessed by comparing the potential demand for credit with the supply from institutional sources.

DEMAND FOR INSTITUTIONAL CREDIT AND CREDIT AVAILABILITY. The requirement for institutional credit for agriculture is calculated as the difference between credit needed to support a given level of agricultural growth and other available sources of financing. The data do not permit farmers' own savings to be distinguished from informal sources of credit, although important differences between informal and formal sources can be noted.

The demand for agricultural investment credit is associated with growth in agricultural gross domestic product (GDP).³ Between 1979/80 and 1993/94, agricultural GDP grew at an average rate of 3.6 percent per year. The ratio of annual investment to GDP in the agricultural sector averaged 6.8 percent

3. Demand for credit is determined by the rate of return from the use of credit. Credit requirements, in contrast, are estimated by indirect methods, such as the gap between total finance needed for optimal use of inputs and funds available from other resources.

between 1979 and 1988 and 6.9 percent between 1988 and 1993. These figures indicate that a 1 percent increase in agricultural output has been associated with agricultural investment of about 2 percent of agricultural GDP in recent years. This investment demand was met partly through farmers' own savings and partly by borrowing from institutional sources (informal sources of credit account for only a small percentage of investment lending). The analysis of savings presented in this chapter's appendix shows that 60 to 70 percent of farm investments are financed by farmers through their own savings.

Given these parameters several alternative scenarios may be constructed to estimate the demand for formal agricultural credit. The scenarios are driven by assumptions regarding agricultural growth rates, the propensity for informal financing of investment, and the capital output ratio in agriculture. Tables 6.10 and 6.11 show the needed agricultural investments as a percentage of agricultural GDP, assuming different combinations of agricultural growth and rates of credit for informally financed investment.

The needed investment credit financed through formal sources can be calculated in (1994/95) rupee values by multiplying the percentage points of investment financed through formal sources by the projected 1995/96 agricultural GDP of Rs 449.1 billion, assuming that agriculture will grow at 4 percent a year between 1994/95 and 1995/96. Doing so yields total investment credit need from institutional sources of Rs 13.47 billion.

According to the 1990 agricultural census of Pakistan, investment on inputs such as fertilizers and insecticides constituted about 10 percent of total annual investment in agriculture. This figure underestimates the share of production expenditures to total investment because the purchase of seeds and water, the leasing of implements, and labor are not included. Evidence from other countries in the region suggests that total expenditure on inputs constitutes about half of total investment expenditures. For simplicity it is assumed that farmers self-finance (or borrow from informal sources) 65 percent of the required production credit need. Production credit required from institutional sources may then be calculated as half of the required investment credit, or 1.5 percent of agricultural GDP. For projected 1995/96 agricultural GDP of Rs 449.1 billion, production credit required from institutional sources is Rs 6.74 billion. Total credit needed from institutional sources of Rs 20.21 billion for 1995/96 is the sum of the estimated investment and production credit need.

How robust are these estimates of required institutional credit? Tables 6.12 and 6.13 and figure 6.1 show the annual agricultural growth rate and the associated disbursed institutional agricultural credit as

Table 6.10. Annual Credit Requirement from Institutional Sources for Agricultural Investment Assuming 1 Percent Growth Required for Investment/Agricultural GDP Rate of 2 Percent

Agricultural growth rate	Percentage points of investment financed through informal sources		
	5	6	7
4	3	2	1
6	7	6	5
8	11	10	9

Source: Government of Pakistan, *Economic Survey*, various years.

Table 6.11. Annual Credit Requirement from Institutional Sources for Agricultural Investment Assuming 1 Percent Growth Required for Investment/Agricultural GDP Rate of 3 Percent

Agricultural growth rate	Assumed percentage points of investment financed through informal sources		
	5	6	7
4	7	6	5
6	13	12	11
8	19	18	17

Source: Authors' estimates.

Table 6.12. *Institutional Credit Disbursement, 1980/81 and 1989/90–1994/95*
(millions of rupees)

Year	Agriculture Development Bank of Pakistan	Toccavi ^a	Cooperatives	Commercial banks	Total
1980/81	1,066.6	8.6	1,128.3	1,816.1	4,019.6
1989/90	9,389.9	55.6	815.1	3,629.5	13,890.1
1990/91	8,323.9	56.3	3,017.5	3,517.6	14,914.8
1991/92	6,996.4	56.3	3,247.0	4,179.6	14,479.3
1992/93	8,643.4	50.8	2,978.0	4,526.5	16,148.1
1993/94	8,989.3	—	2,621.5	4,063.3	15,647.1
1994/95	14,575.7	—	3,756.7	4,071.0	22,403.3

— Not available.

a. Toccavi are loans advanced by the government to provide relief in times of calamity and distress.

Source: Government of Pakistan, *Economic Survey*, various years.

Table 6.13. *Agricultural Growth and Institutional Lending, 1989/90–1994/95*
(in percent)

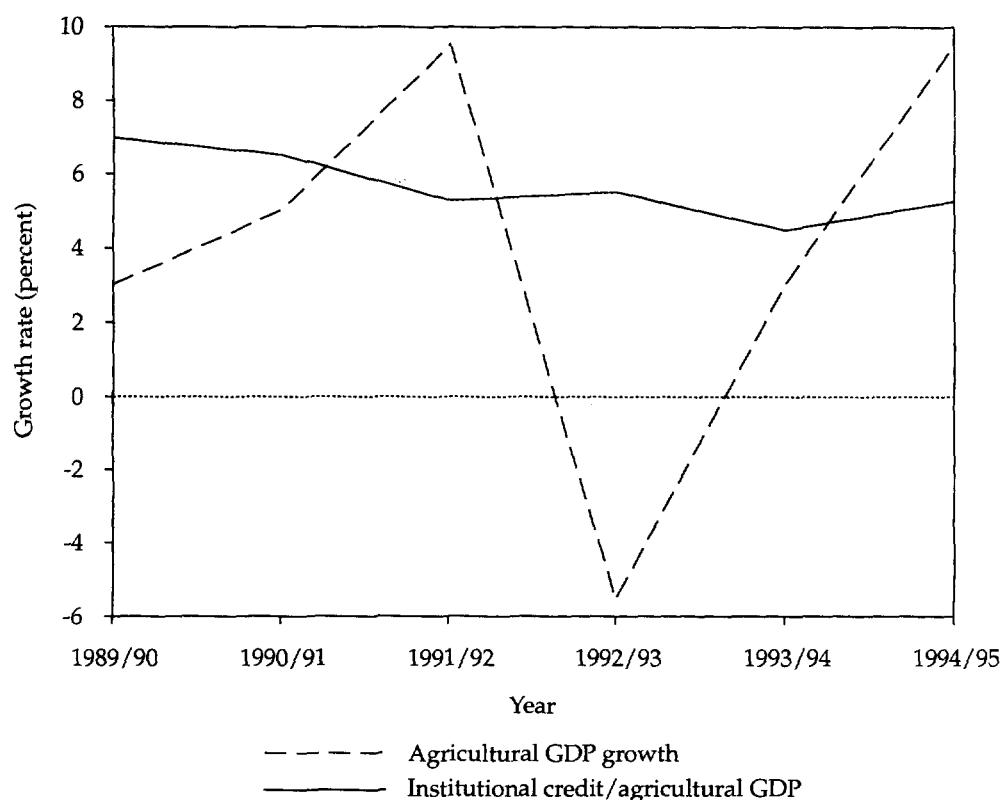
Year	Agricultural GDP growth	Institutional credit/agricultural GDP
1989/90	3.03	7.0
1990/91	4.96	6.4
1991/92	9.50	5.1
1992/93	-5.29	5.4
1993/94	2.86	4.4
1994/95	9.49	5.1
Average excluding 1992/93	5.05	5.6

Source: Government of Pakistan, *Economic Survey*, various years.

a share of agricultural GDP between 1989/90 and 1994/95. Ignoring 1992/93, when agricultural GDP fell sharply because of monsoon flooding, the average annual growth rate of agriculture was 5.05 percent and average annual disbursed credit as a percentage of agricultural GDP was 5.54. Recent experience shows that a 1 percent increase in agricultural GDP is associated with a rate of institutional credit to agricultural GDP of 1.12 percent. Table 6.10 shows that a 4 percent growth rate would require an institutional credit to agricultural GDP rate of 3 percent (assuming that 5 percentage points of investment is financed through informal sources). The two estimates are close.

If the agriculture growth target is set at the much higher rate of 8 percent (the upper-bound growth scenario), more capital-intensive technology will be required, pushing the investment to GDP rate to 3 percent (table 6.11). Assuming that the proportion of self-financed investment changes modestly (about 2 percentage points of the needed credit), the investment credit required from institutional sources would be 17 percent of agricultural GDP. Total credit needed from institutional sources would thus depend on various factors and could vary between 3 and 17 percent of agricultural GDP under alternative assumptions.

At least in the 1989/90 to 1994/95 period, farmers have not been constrained by lack of credit. The sector has grown at a healthy annual average rate of 5.1 percent (ignoring the abnormal year 1992/93), supported by disbursed credit by institutions of 5.6 percent of agricultural GDP, which is close to the rate required to support growth. Yet the 1985 survey, based on farmers' direct response to questions, estimates the ratio of credit needed to available credit at 3:1. Why is this gap so much larger than the gap

Figure 6.1. *Agricultural Growth and Institutional Lending, 1989/90–1994/95*

Source: Table 6.13.

estimated in table 6.11? First, farmers may want to shift credit demand from the more expensive sources to the cheaper ones. Second, farmer estimates of credit need may be based on best farmer practices. Finally, smallholders with less access to credit from formal sources may indeed be credit constrained.

In restructuring the rural credit market policymakers should seek to ensure that (a) credit must continue to be made available at current levels (or higher levels if a faster rate is desired) without endangering the financial survivability of the lending institutions, (b) credit reaches smallholders, so that they can adopt the best practice; and (c) the credit needs of nonfarm business enterprises, women in rural areas, households engaged in livestock business, and the rural poor are met. For a discussion of alternative approaches to estimating farm credit requirements see box 6.1.

CREDIT DELIVERY PRACTICES OF INSTITUTIONAL SOURCES. A comparison of the lending practices of institutional sources of credit in Pakistan, including the Agricultural Development Bank of Pakistan (ADBP), commercial banks, and cooperatives, is shown in table 6.14.

The ADBP was established in 1961 by merging the Agricultural Development Finance Corporation, founded in 1952, and the Agricultural Bank of Pakistan, founded in 1957. The bank's charter is to modernize Pakistan's agriculture and promote the growth of the cotton industry in rural areas. The bank has 17 divisions, 51 regional offices, and 334 branch offices and is headed by its chairman, who is assisted by executive directors.

The ADBP is funded by the State Bank of Pakistan (SBP); by multinational credit agencies (the World Bank, the International Development Association, the International Fund for Agricultural Development, and the Asian Development Bank); by bilateral sources, particularly the Overseas Economic Cooperation Funds (OECF) of Japan; and by mobilization of deposits. It received its first credit from the World Bank in 1965/66, and aid-giving agencies and the SBP remain the main source of funds.

Box 6.1. Alternative Approaches for Estimating Farm Credit Requirement

The State Bank of Pakistan uses a direct approach to estimate the need for credit in agriculture (State Bank of Pakistan 1989). The methodology for this approach was devised in 1973/74. For estimating short-term loans the procedure involves a detailed breakdown of crops sown and key inputs used. Assumptions are then made regarding the proportion of inputs that farmers purchase. These estimates are revised periodically (revisions were made in 1978/79 and in 1983). In 1987 a committee was set up to revise the estimates based on farm surveys carried out by the Punjab Economic Research Institute (PERI). That committee revised upward the estimates of percentage of acreage for which seed is purchased for nine crops. Revisions were also made for electricity charges, tractor hire, and pesticides. For long-term loans similar revisions were made for key investments, such as land and watercourse improvement, tubewells, open wells/Persian wheels, threshers, and other farm machinery. In order to capture differences in credit needed across farm size, periodic adjustments were also made for the weights of small, medium, and large farms in total farmed acreage.

How closely does the indirect approach adopted here approximate the direct approach used by the State Bank in its credit allocation decisions? According to the indirect approach, growing at the trend rate of 4 percent the projected 1992/93 agricultural GDP of Rs 350 billion would be associated with a credit requirement from institutional sources of Rs 15.5 billion. Actual credit disbursed by institutional sources was Rs 15.4 billion. (Because of monsoon flooding, actual 1992/93 agricultural GDP was estimated at Rs 297.8 billion, and actual credit allocation was considerably higher than that required by actual GDP.)

Another comparison between the two approaches may be made on the basis of the total credit requirement of the farm sector. Using the direct method the State Bank estimates the 1995/96 farm credit requirement for investment (medium- and long-term requirement) at Rs 29.3 billion, or 6.8 percent of the projected agricultural GDP (estimated at Rs 453 billion if agriculture grows by 4 percent over its 1994/95 value). The indirect method estimates the requirement for investment credit at a somewhat higher 8 percent. The main difference in the two approaches is for production, or short-term, credit. The State Bank method estimates short-term credit at nearly twice investment credit whereas the indirect approach adopted here, based on evidence from other countries, estimates it at half the investment credit requirement.

Demand for credit may be higher as some borrowers shift to institutional sources if credit is available at rates lower than prevalent rates in the informal market.

The bank provides short-term, medium-term, and long-term loans to 100,000 borrowers each year. Short-term loans (6 to 18 months) are made primarily for the purchase of agricultural inputs. Loans for poultry farming are also made. Medium-term loans (18 months to 5 years) are extended for the purchase of tractors and pumping sets, and for sheep and goat farming, dairy farming, beekeeping, and sericulture. Long-term loans (5 to 10 years) are made for the purchase of tubewells and agricultural machinery (tractors, harvesters, sprinklers, drilling equipment) and for nonagricultural activities such as poultry farming, warehousing, forestry, orchards, tea plantations, and fisheries.

Loan collateral includes immovable property, installed machinery, land leased for 99 years, movable property, bank guarantees, government guarantees, insurance policies, saving certificates, and crop hypothecation. Personal guarantees are also accepted. The rate of interest is 13.5 percent for general credit and 17 percent for project credit.

The majority of the bank's lending (56 percent) is long term and its lending has contributed to the mechanization of agriculture. In 1995/96, purpose-wise distribution of credit under agricultural loans shows a disbursement of Rs 3,262 million for financing purchases of close to 16,000 tractors, followed by Rs 3,161 million for fertilizer, Rs 1,445 million for pesticides, Rs 1,045 million for hybrid/improved seeds, Rs 467 million for dairy farming, and Rs 173 million for tubewells. Loans for the purchase of tractors represent such a large proportion of the bank's lending that its policies determine to a large extent the profitability of the local tractor industry. So significant are tractor loans that the bank uses the proportion of nontractor loans, which dropped from 64 percent in 1989 to 53 percent in 1994, as a measure of diversification.

The ADBP pioneered supervised credit in Pakistan. Designed mainly for smallholders, the scheme combines the provision of credit with technical guidance and advice on disciplined repayment. The main delivery agents are mobile credit officers, young agricultural graduates with rural backgrounds who

Table 6.14. *Comparison of Lending Practices of Institutional Sources of Credit*

<i>Category</i>	<i>ADBP</i>	<i>Commercial banks</i>	<i>Cooperatives</i>
Purpose of the loan	25% production and 75% development loans	78% productions loans	n.a.
Share of credit targeted at subsistence framers	42.8%	76.7%, but surveys show many of these to be proxy loans for big landlords	96.6%, but surveys show that many cooperative societies were one-man operations
Collateral requirement	Tangible security required for medium-term loans	63% of disbursement through personal sureties, passbooks (land) also common	Land and other immovable property
Loan recovery rate	60%	n.a.	About 90% in Punjab and Northern areas; loan operations suspended in Sindh and Northwest Frontier Province because of poor recovery
Treatment of default	Existing laws not enforced	Existing laws not enforced	Existing laws not enforced. Special Coop Tribunals proposed to improve enforcement
Supervision of credit utilization	In theory, 1,450 mobile credit officers supervise credit closely	Small number of agricultural officers results in inadequate supervision	Poor coordination between provincial government departments and the Federal Bank for Cooperatives renders supervision inadequate
Estimated cost of credit delivery	9.1%	18.6 %	15.8%

n.a. Not applicable.

Source: Government of Pakistan, *Agricultural Statistics*, 1992; company annual reports 1988–92.

provide a link between the bank and its farmer clients. Each of the 1,450 mobile credit officers serves 15 to 20 villages and most villages are covered by the program.

The bank's principal target market consists of the 679,000 small and medium-size farmers owning less than 25 acres, who represent 90 percent of the farming community and own 64 percent of total cultivated area. More than 60 percent of its loans are made to medium-size farmers owning more than 12.5 acres. The bank's experience with targeting credit to smallholders and landless tenants (tenants farming no more than 2 hectares of irrigated and 4 hectares of rainfed land) has been very limited and coverage has been modest. One reason that smallholders and landless tenants have been largely ignored by the bank may be the emphasis on the passbook system, which covers 83 percent of bank customers, compared with 21 percent for the nationalized commercial banks. Because of bureaucratic problems very few marginal farmers have been able to get passbooks. Recently, Kissan Bank windows were opened for smallholders. But without revised procedural changes, the target of reaching 60 percent of marginal farmers may not be achieved.

In 1992 the bank began to provide credit to women. For this purpose 34 female mobile credit officers and 27 female village assistants were hired, and the bank has also made loans available to microenterprises.

Despite the promising design of the ADBP and its many innovative schemes, it has not performed well as a viable financial institution. Historically, the bank has been used as an instrument for distributing agricultural subsidies rather than as a financial institution that operates in accordance with sound commercial guidelines. Staffed principally by agriculturists, the bank assesses development projects on technical and engineering grounds rather than in terms of their economic and financial viability. As a result loan recovery has declined and bad or doubtful debt has increased. Given a low deposit base, the bank is increasingly dependent on subsidies from the SBP. With the state bank gradually cutting back on concessionary lending, the financial viability of ADBP appears bleak.

A review commissioned by the World Bank in August 1993 found problems in the bank's liquidity, loan recovery, and personnel and administration. Between 1990 and 1993 the ADBP benefited from cash inflows that improved its liquidity. The SBP lent Rs 8.5 billion and subscribed for Rs 1.2 billion in shares. Foreign debt administered by the SBP led to a net cash inflow of Rs 2.9 billion. More recently, however, the ADBP's benefactors have started to pull back. Three of the foreign agencies providing funds to the bank suspended drawdowns in 1993 and the SBP has increased pressure to improve deposit mobilization. Despite these pressures, the ADBP's deposit-taking has failed to make any significant contribution to its funds. Total ADBP's deposits stood at Rs 1.04 billion in 1990, fell to Rs 0.99 billion in 1993, and increased to Rs 1.13 billion in 1996.

Despite a campaign to improve recovery, led by the ADBP chairman, the bank's loan recovery rate deteriorated from 61 percent in 1990 to 54 percent in 1994. In 1994 loan recovery in Punjab was 66 percent, but only 27 percent in Baluchistan. Extensive rescheduling takes place, which distorts recovery rates and erodes security cover. A policy of more aggressive write-offs needs to be adopted to improve recovery.

The principal problem of repayment of loans under general credit is slow payment because of overly elaborate procedures and documentation. Because interest is not charged on past dues, profitability of the portfolio is eroded. Analysis of ADBP's portfolio of project loans reveals a dismal picture. As of April 1993, 42 percent of all loans, amounting to Rs 2.9 billion, were classified as "sick" or had been referred to the Banking Tribunal. In 1994, recovery of current dues under project loans was as low as 12 percent, while recovery of past dues under project loans was 9 percent. As a result of the failure of project loans, which comprise 15 percent of total loans outstanding and were meant to encourage agribusinesses, project lending has been banned since 1992.

Portfolio performance is adversely affected by the quality of administration and staff employed by the ADBP. Instead of upgrading staff quality, the bank has continued to increase the number of staff. The result is a deterioration in portfolio performance despite the increase in administrative expenses. The additional administrative expenses have been absorbed by the head office, where staffing increased by 16 percent between 1989 and 1992. Over the same period the ratio of salaries to total expenses increased by 68 percent, 3 percentage points higher than in commercial banks. The challenge is to reverse the staffing situation so that a larger proportion of employees is involved in income generation and loan recovery. The ADBP management acknowledges that the large-scale promotions made in the past few years without reference to the vacancies or actual requirements and without minimum qualifications of graduation for officers have deteriorated operational efficiency in the bank. The bank has also suffered from high turnover of senior management; between 1988 and 1996 the bank had eight chairmen, with an average tenure of less than a year each.

An important lesson from international experience is that standard financial ratios such as return on equity and return on assets are not reliable indicators of the economic soundness of agricultural credit institutions because of the endemic subsidies, such as replenishment of equity, cheap loans, and discounts from the central bank, that bolster these ratios. Because of these subsidies credit institutions can continue to enjoy a good public image, even though their sustainability is in serious doubt. To evaluate the true health of a financial institution a subsidy dependency index (SDI) is used. The SDI shows the

amount by which the current interest rate on agricultural loans would have to increase to cover the cost of lending, assuming all incoming funds and services were charged market rates (Yaron 1992). Several financial intermediaries were reassessed using the SDI. Thailand's Bank for Agriculture and Agricultural Cooperatives performed best, with an SDI of 26 percent in 1988. The Jamaican Agricultural Credit Bank performed worst, with an SDI index of 312 percent in 1991. The SDI for the ADBP was 31.4 percent in 1988, 25.5 percent in 1990, and 36.2 percent in 1992 (table 6.15). It fell in 1990 because ADBP raised Rs 5.6 billion on the interbank market, which reduced the amount borrowed at a subsidized rate. The interbank borrowing was partly repaid in 1991 and fully repaid by June 1992 through increased borrowing at a concessionary rate from the SBP. The SDI reveals that the interest rate that the ADBP should have charged on its lending to eliminate the subsidy was 15.5 percent in 1988 and 16.6 percent in 1992, compared with actual rates of 11.8 percent and 12.2 percent.

Interest rates that were set too low combined with burgeoning administrative expenses caused the net profit of the bank to decline from Rs 301 million in fiscal 1989 to Rs 193 million in fiscal 1994. As a proportion of total assets, profitability fell from 9.3 percent to 0.5 percent.

Commercial bank lending in rural areas is a recent phenomenon in Pakistan. Prior to independence in 1947, there were two sources of institutional credit for rural areas: *tocavi* loans, advanced by the government to provide relief in times of calamity and distress, and cooperative credit. Both types of lending catered mainly to agricultural credit needs. After independence commercial bank activity picked up momentum in urban areas first, with commercial bank involvement in agriculture confined largely to the financing of marketing operations with commodity stocks as collateral. Natural hazards, volatility of production, the high cost of lending to smallholders, and the difficulties of collateral inhibited lending for agriculture.

The first significant change came in 1972, with the promulgation of the Banking Reforms Act, which assigned the SBP the role of increasing the flow of credit to the agricultural sector. The SBP set targets for lending to agriculture, imposed penalties for default, and ensured a 50 percent subsidy on losses on agricultural lending. An Agricultural Credit Advisory Committee was set up to work out farmer credit requirements based on the cost of inputs, estimates of farmers' savings, and availability of credit from the informal market. The system of personal surety as collateral was introduced, as was the use of passbooks as evidence of landholding. The Agriculture Produce Rules, promulgated in 1973, stipulated that 70 percent of institutional lending should be made to smallholders with holdings of 12.5 acres or less, 20 percent to farmers with holdings of 12.5 to 50 acres, and 10 percent to large farmers with holdings of more than 50 acres.

The Banking Reforms Act spurred agricultural lending by commercial banks, which reached Rs 1,381.2 million by 1978, a 16-fold increase over the 1972/73 level of Rs 85.7 million. The second phase of agricultural lending by commercial banks began in 1979/80, with the introduction of interest-free loans for smallholders. Under pressure of demand, disbursements gathered momentum: the peak level reached in 1986/87 was 85 times the starting level of 1972/73. Because of abuses, however, the government abolished the scheme in June 1988, promising to establish a Grameen Bank type of institution for the

Table 6.15. *Subsidy Dependency Index for the Agriculture Development Bank of Pakistan, 1988–92*
(in percent)

Year	Actual rate charged on loans	Rate needed to eliminate subsidies	Subsidy dependency index
1988	11.8	115.5	31.4
1989	11.9	15.4	29.6
1990	11.9	14.9	25.5
1991	12.5	16.5	31.6
1992	12.2	16.6	36.2

Source: Authors' estimates.

rural poor. The result was a sharp decline in commercial bank lending, which fell to Rs 3,052 million in 1988/89 and stabilized at Rs 4,063 million in 1992.

Agriculture represents only 4.9 percent of the commercial banks' portfolio and commercial banks currently disburse only 26 percent of institutional credit for agriculture, 57 percent of which is provided by the ADBP and 17 percent of which is provided by cooperatives. In June 1994 total outstanding advances were Rs 303 billion and advances outstanding against agriculture were Rs 14 billion (State Bank of Pakistan 1994).

Commercial bank loans to agriculture have been made largely to meet SBP policy directives. To curb abuses of the interest free-loan program, the lead bank system was introduced in 1987. Under this system each union council was assigned a designated bank that had the exclusive right to extend agricultural loans in that union council. This change in policy explains the sharp decline in lending from Rs 7.3 billion in 1986/87 to Rs 5.2 billion in 1987/88. With the discontinuation of interest free-loans, lending fell to Rs 3.2 billion in 1988/89, a decline of 58 percent over two years. While the principle of lead banking represents a safeguard against multiple lending, it reduces commercial bank financial intermediation, since nonlead branches are restricted only to deposit taking. It also introduces an element of monopoly into banking.

To improve the speed of credit delivery and ensure linkages between credit extension and technical guidance, the Pakistan Banking Council introduced the Supervised Agricultural Credit Scheme in 1987. Initially, the scheme was to cover 107 *tehsils* using mobile credit officers. But progress has not been satisfactory.

Commercial banks could function as the central pillar in the design of a viable rural financial system. As a result of the supervised credit scheme, commercial banks now operate 3,000 rural branches. Unlike other institutions, which have functioned solely as disbursement windows, the commercial banks have been able to mobilize savings from rural respondents; 29 percent of their deposits are estimated to come from rural areas. Most important, in contrast to cooperatives and the ADBP, whose funding sources are concessional lines of credit from the state bank, commercial banks use their own deposits to make loans.

The cooperative credit movement in the Indo-Pakistan subcontinent began in 1904, with the promulgation of the Cooperative Credit Societies Act. Its basic objective was to provide an alternative to village moneylenders, who had been the only source of credit. Registrar Cooperative Societies were created under the statute and empowered with the power to register, audit, and supervise cooperative societies. Promotional work was also entrusted to the registrar.

Under the Cooperative Societies Act of 1912, the government extended the scope of the movement beyond agricultural credit. Functionally, the role of the societies was extended to the supply of inputs, such as seed, manure, and implements, and to the marketing of agricultural produce. Geographically, the movement was expanded to urban areas for procurement of goods. Cooperative societies were federated into a secondary structure (central cooperative banks) at the district and *tehsil* level. These in turn were dovetailed into a provincial structure to form provincial cooperative banks.

Pakistan inherited both the conceptual framework and the organizational structure of the cooperative movement from British India. Since independence the history of the movement can be divided into five phases. In the first phase (from the creation of Pakistan to 1955) the cooperative movement was shaped by the response to the mass migration of the trading and industrial community to India following the partition of the subcontinent. Cooperatives began to support activities such as processing of agricultural raw materials, procurement and distribution of food grains and consumer goods, and financing of trade. Even in this early phase the cooperative movement came to be dominated by urban businessmen, who set up spurious societies to obtain credit from cooperative banks and thus diverted resources from rural areas. The second phase (1956–61) was a period of readjustment following the withdrawal from commercial activities. The third phase (1962–66) saw a revival of the cooperative movement. In 1962 the government issued a new policy that gave cooperatives the added role of organizing the distribution of farm inputs and the marketing of output. Cooperatives were also expected to encourage farm mechanization and to promote rural industry and handicraft. A high-powered Cooperative Development Board was set up as an autonomous entity with five official and six

unofficial members. The board acquired a few industrial units and extended loans at concessional rates to several cooperatives set up by influential people. After strong public reaction to the "capitalist cooperatives," as they came to be called, the government abolished the board in 1966. In the fourth phase (1967–76) the number of cooperative societies increased from 16,848 to 29,528. Most of the societies (23,000) were agricultural cooperatives, whose membership totaled 1.2 million. The tier of the central cooperative banks was abolished, leaving only the provincial cooperative banks and the primary societies in the provinces. At the apex was the Federal Bank for Cooperatives (FBC), whose establishment in 1976 marked the beginning of the fifth phase. The FBC has a dual charter of financing provincial cooperative banks and regulating their activities and promoting the cooperative movement. The provincial cooperative banks are the principal customers of the FBC. With a network of 220 branches these banks cover the country's 118 administrative districts. At the primary level there are 62,681 cooperative societies, with a total membership of nearly 3.5 million (table 6.16).

Cooperative credit is used essentially for short-term purposes, mainly to finance agricultural inputs. By June 1994 the FBC had lent Rs 30.8 billion, of which only Rs 458 million (1.5 percent) was for the medium term. Annual lending was about Rs 3 billion between 1992 and 1995, of which less than Rs 20 million a year was medium-term credit.

In principle, recovery of loans should not pose a problem because loans are guaranteed by provincial governments. Yet lending was suspended for 5 years in Sindh and 10 years in Baluchistan because of persistent default. In 1994 the Northwest Frontier Province (NWFP) also defaulted and loan operations were suspended. Loans amounting to Rs 1,058 million outstanding against Sindh (Rs 419 million), NWFP (Rs 560 million), Azad Kashmir (Rs 56 million), and Baluchistan (Rs 23 million) had to be rescheduled. In Punjab, which receives 90 percent of all loans, and the northern areas, about 90 percent of losses were recovered in 1993/94 after scheduling, which has helped sustain FBC lending operations.

The FBC earned only Rs 10.8 million in 1993/94. The profitability of the cooperative banks is low because they operate on the basis of a service charge, set as low as 1.49 percent in 1993/94. The low level of profitability is not the main problem, however. Continuous experimentation and extensive changes have eroded confidence in the cooperative movement, which has passed through three periods of debasement and corruption since 1947. In the 1950s the movement was deflected from its primary constituency, smallholders. In the early 1980s interest-free loans were usurped by the prosperous rural elite. A survey conducted by the Punjab Economic Research Institute concluded that 61 percent of the societies were fictitious and 73 percent of the loans were bogus. Smaller farmers were found to be inflating their farm size to get larger loans, and larger farmers were found to be understating their holdings to become eligible for cooperative credit. In the early 1990 the Cooperative Finance Corporations collapsed after taking deposits of Rs 15 billion from mostly rural residents and then investing the funds in risky ventures for the personal gain of cooperative organizers. These cooperatives were actually real estate companies that had managed to register as cooperative societies. The government is endeavoring to provide relief to the quarter million people who were defrauded by this scheme.

Table 6.16. *Membership in Rural Cooperates, 1994*

<i>Province</i>	<i>Number of cooperatives</i>	<i>Number of members</i>
Punjab	46,729	2,234,453
Sindh	3,998	747,670
NWFP	7,242	405,472
Azad Kashmir	3,757	41,327
Baluchistan	752	36,856
Northern areas	383	16,466
Total	62,861	3,482,244

Source: Federal Bank for Cooperatives data.

The cooperative movement also suffers from several institutional weaknesses, which have eroded the movement's credibility, including the following:

- **Uneven coverage**—Nearly 63,000 cooperative societies are located in 15,000 villages while 30,000 villages have no societies. Moreover, 34 percent of farms are cultivated by tenants, who cannot join credit cooperatives because they do not own immovable property (a membership requirement).
- **Highly subsidized rates**—Although interest-free lending was halted in 1988, the cost of cooperative credit is still very low: 14 percent is charged for production loans, with a 4 percent rebate for prompt payment.
- **Absence of professional management**—No mechanism exists to ensure that only genuine societies are registered and the entire cooperative credit system lacks the professional capacity to appraise, prioritize, and recover loans. The audit function is not being performed by the Provincial Cooperative Department, which lacks adequate staff, and the provincial cooperative unions have no funds for educating and training society members.
- **Weak provincial banks**—The provincial banks are unable to function as lending agencies. The functions of scrutinizing loan applications, fixing priorities, determining allocations, and sanctioning loans are performed by the Provincial Cooperative Department, with the provincial banks functioning merely as cashiers of the department. Recovery powers also lie with the department, rather than with bank managers, and are subject to a preemptive right by the FBC. Recoveries must be passed on to the FBC within 30 days, while the provincial banks' advances disbursed before the establishment of the FBC remain blocked in overdues. The credit received by these banks from the FBC is guaranteed by the provincial governments, but their own loans to the primary societies have no such security.
- **Poor portfolio management**—No criteria exist for identifying bad debts. According to one estimate, provisions cover only 36 percent of the loans that have been overdue for 10 years (Scott and Redding 1998). The system of classifying loans into performing and nonperforming categories does not exist in the provincial banks, which have not written off an agricultural loan since 1985. Recoveries are often affected through the mechanism of sanctioning fresh loans, thus providing a false picture of the viability of operations.
- **Inappropriate organizational structure**—The FBC's organizational structure is flat, with all major functionaries reporting directly to the chief executive. Its focus is exclusively on loan disbursement and recovery, and no resources are allocated to research or to development of cooperation. Its board is large and unwieldy and staff suffer from low morale. And turnover of top management is high: in 1994 eight managing directors came and left in quick succession, contributing both to poor management and low morale. In terms of financial resources the FBC is completely dependent on the state bank, making it insecure and uncertain. The chain of this debilitating dependence extends to the primary level and renders the entire structure fragile.
- **Lack of financial intermediation**—The FBC does not mobilize its own resources but functions mainly as a conduit for cheap credit provided by the SBP. With the 1996 lending rate of 1.5 percent, this may not be possible.

Although the cooperative movement has been successful in many economies, including Taiwan (China) (box 6.2), Pakistan's experience with rural cooperative credit has been unsatisfactory. Such movements must be supported from the top but must be managed from the grass roots if they are to survive on their own strength.

Informal Sources of Rural Credit

The credit needs of the majority of rural enterprises are met in large part by informal credit sources that extend credit based on personal contact and local sanction. Informal sources do not provide term finance

Box 6.2. A Success Story in Rural Credit Cooperatives: Taiwan's (China's) Township Farmer Associations

The Taiwanese cooperative system consists of 280 township farmer associations serving virtually all farming families. Largely as a result of this scheme, farm productivity in Taiwan (China) is among the highest in the world. Interest rates charged by the associations are positive and cover the cost of funds. By 1970 these associations were mobilizing 30 percent more funds from members than they were relending. A 1992 study carried out by Ohio State University rates the Taiwanese scheme very highly on four important criteria: number of people served, participants' transaction costs, loan recovery, and level of deposits to agriculture. The surplus, which continues to expand, is being on-lent to other sectors of the economy.

The Taiwanese system was initiated in 1948 with U.S. assistance. A Sino-American Joint Commission on Rural Reconstruction (which became the Council of Agriculture after U.S. involvement ended in the 1970s) was established to help promote economic growth. The program initially used targeted subsidies but later began to loosen up. In addition to providing rural finance, the commission sought to carry out comprehensive rural land reform and promote more participatory rural government by establishing farm cooperatives. These institutional changes acted as a catalyst in channeling the already high rural savings of a progressive Chinese rural community to support agricultural growth.

for investment other than housing finance, but rather respond to temporary gaps in consumption, immediate unforeseen contingencies, and emergencies.

The informal market is undergoing structural changes in response to the evolving socioeconomic landscape. The role of landlords and moneylenders is declining and the role of market intermediaries is growing as the commercialization of agriculture proceeds apace.

The main limitations of the informal market pertain to scale, space, and time. The market is segmented from the national financial system, reducing its capacity for financial intermediation. Informal finance is essentially a local phenomenon that depends on local contacts. Its fragmented and local character is both its strength and weakness. Freedom from regulation is also a double-edged sword: the market gains flexibility, adaptability, and resilience but loses protective legal mechanisms.

The informal market can be divided into four categories: socially based arrangements, commercial arrangements, a land-based system, and moneylenders.

SOCIALLY-BASED ARRANGEMENTS. One-third of noninstitutional credit comes from friends and relatives, who do not charge interest and operate on the basis of reciprocity. Friends and relatives sometimes operate through a committee system. These committees (known as *bisis* in Pakistan and ROSCAs [Rotating Savings and Loan Associations] in the economic literature) enforce the discipline of compulsory savings. In India and Cameroon some of these committees have evolved into banks.

ROSCAs are simple structures in which a leader takes the initiative and organizes a group of 6 to 40 people, who regularly pool savings of an agreed-upon amount. The collection is offered to each member in turn, interest free. The leader generally takes the first collection and receives no other compensation, although leaders sometimes take a commission in exchange for assuming the responsibility for preventing default.

In Pakistan two types of committees are common: ordinary committees and discount-based committees. In ordinary committees, the draw is typically done monthly. Members continue to contribute until the cycle is completed and all members have received proceeds from the collection.

A discount-based committee, also called an auction-based committee, is organized in the same manner as an ordinary committee but the basis of disbursement is the lowest bid at a regular auction. The difference between the amount collected and the amount disbursed is shared equally by committee members, who usually use this profit to reduce their contribution. Those who do not participate in the auction receive the collection last.

A third institution, called the lucky committee, is banned but continues to operate illegally in some places. It operates essentially as a lottery. The amount to be drawn each month is lower than the monthly

collection and announced in advance. The difference between the collection and the disbursement goes to the organizer. The disbursement is made by drawing lots and the winner pays no future contributions. Those who are not lucky receive their disbursement last. The organizer makes a sizable monthly profit. The committee thus becomes a business venture and ceases to be a purely savings instrument. The excitement of the lucky draw replaces the regularity and predictability of the ordinary committee.

COMMERCIAL-BASED CREDIT. Commercially-based credit is linked with the supply of inputs or the purchase of output and is common in the farming community, particularly among microenterprises. The marketing intermediaries who extend the credit may be commission agents (*arhtis*), village traders, or shopkeepers. According to some estimates (State Bank of Pakistan 1994), this channel provides 25 percent of rural credit. About 17 percent of noninstitutional credit for farmers comes from this source; with more organized marketing its importance may increase.

Although the difference in prices for cash terms and credit terms may be substantial, credit from suppliers is popular among microenterprises. Whereas farmers can obtain production loans from institutional sources to cover the cost of inputs, microenterprises must depend on market channels. Most microenterprises purchase their raw material on credit for up to a month. Interest rates range from 2 to 15 percent a month and are implicit in the excess prices charged on credit-based purchases. According to a survey conducted by Development Research and Management Services for the Institute of Social Studies Advisory Service (1995), the difference in prices between cash and credit purchases is typically 10 to 15 percent.

Buyers sometime make advance payments to producers to help them purchase raw materials. Although this payment is disguised as an advance, there is an implicit interest rate that can be as high as 15 percent a month.

This arrangement is reversed in the case of the *parchi* system. The *parchi* is an IOU given by a buyer who does not wish to make a cash payment. Instead the buyer issues a *parchi* at a higher price. The *parchi* indicates the quantity, price, date of payment, and amount due. *Parchis* can be discounted in the market at rates of 2 to 7 percent a month. The period of maturity ranges from 20 to 60 days. Confidence in the viability of the borrower is critical because there is no legal recourse.

LAND-BASED CREDIT ARRANGEMENTS. Land-based credit is the informal instrument used by tenants and subsistence farmers. It is widely used in Sindh, Baluchistan, and Southern Punjab. Credit is extended by the landlord for purchase of inputs and for consumption. No collateral is required, but the credit generally constitutes the first charge on the produce. According to the 1973 *Rural Credit Survey* (Pakistan Agriculture Census Commission 1973), interest rates for this type of credit were about 60 percent higher than institutional rates. About 11 percent of informal finance comes from land-based credit arrangements. With the decline of feudal influence its importance may diminish over time.

MONEYLENDERS. Since independence professional moneylenders have not been a significant part of the credit system in the rural areas. A survey conducted by the World Bank found that moneylenders provided only 6 percent of rural credit in five Asian countries studied (World Bank 1989). In Pakistan the proportion is even smaller. Interest is paid monthly at rates of 2 to 4 percent a month. Moneylending is considered a dishonorable profession and its importance is declining.

Advantages and Disadvantages of the Informal Market for Rural Credit

Informal credit typically involves low transaction costs and short transaction times. The lag between agreement and disbursement of credit is minimal, no collateral is required, and documentation is minimal. Moreover, unlike the institutional market, the informal market makes loans for consumption. On the negative side, the informal market is unregulated and there are no reserve ratios or prudential regulations, legal recourse on default is rare, no standard terms or conditions are established, interest rates and maturity periods vary widely, and interest rates are usually twice as high as those charged by institutions. Interest

rates can be usurious where competition from the formal market is weak. As the availability of formal credit grows, rates of interest for informal credit are believed to be declining, although firm data are not available.

Rural Credit for Poverty Alleviation

Policy-directed credit to the rural poor is justified both on equity grounds and because of the market's failure to assess the risk of lending to the poor and to develop instruments for managing that risk. Access to policy-directed credit can help the poor by enabling them to acquire assets and support consumption in times of distress. The policy response has been to provide cheap credit to poor households because of the belief that the poor cannot afford market interest rates, institutional lenders are too cautious, and professional moneylenders are exploitative. The international experience with government schemes to provide cheap credit to the rural poor is not encouraging, however (World Bank 1990a). Only 5 percent of poor farmers in Africa and 15 percent of poor farmers in Asia and Latin America have had access to such credit, and surveys carried out in Pakistan show that the poorest farmers obtain less than 6 percent of their credit from formal sources (see table 6.8).

The problem is twofold. First, targeting the poor has been difficult and much of the subsidized credit has leaked to relatively richer rural households. Second, the transaction costs of lending to the poor are high, which has made the subsidy for cheap credit large and rendered the programs unsustainable. Because of these problems many countries, including Pakistan, have sought to create special vehicles for delivering credit to the poor in the form of direct income transfers or credit for income-generating activities.

If actually used for income-generating activities, agricultural credit could become one of the useful means to redress poverty. In Pakistan, about 20 percent of the rural population would continue to need credit to engage in sustainable income-generating activities, however.

The largest concentrations of the rural poor are among the landless (45 percent) and among tenants and marginal landowners (46 percent). Livestock constitutes the most important source of income for the rural poor (28 percent), followed by crop income (24 percent) and nonfarm microenterprise (20 percent) (table 6.17). To lift the poor out of poverty, rural poverty alleviation programs must focus on these principal sources of income. Indirectly, of course, a credit program for agriculture would increase crop incomes as well as income from farm labor. Credit programs for rural microenterprises and credits to support consumption for the very poor would still be needed, however.

A variety of programs aimed at providing credit to the poor exist in Pakistan, including programs by nongovernmental organizations (NGOs) and the self-employment program, begun in 1992.

Nongovernmental Organizations

Bangladesh's Grameen Bank, perhaps the most successful NGO credit program for rural poverty alleviation, has inspired similar efforts not only in other developing countries, such as Indonesia and Malaysia, but also in the United States. The salient features of Grameen Bank are described in box 6.3.

Table 6.17. *Sources of Income of the Rural Poor in Pakistan, 1985*
(percent)

<i>Source of income</i>	<i>Share of income</i>
Livestock	28
Crops	24
Nonfarm enterprise	20
Wages and salaries	18
Remittances	7
Other sources	3

Source: Ercelawn (1984).

Box 6.3. Bangladesh's Grameen Bank: A Model Program to Serve the Rural Poor

The success of Bangladesh's Grameen Bank in meeting the credit needs of the rural poor stems largely from the bank's ability to control the often high transaction costs of lending to this segment of the market. Grameen Bank overcame this problem through a group-based lending program that uses peer pressure to monitor and enforce contracts and to screen borrowers (Khandker, Khalily, and Khan 1994).

The bank targets poor landholders with less than 0.50 acres of land. It makes loans for natural disaster relief, food storage, and capital recovery. Borrowers are required to attend weekly meetings and participate in other welfare activities. Because the opportunity cost of the meetings is high and loan amounts are small (US\$65 for the first loan, rising to a maximum of US\$250 for subsequent loans), large farmers and other rural rich are excluded from the program. The Bank's principal target group is women, who constitute 94 percent of total bank membership and receive 80 percent of total lending. Along with loans they receive training in maternal health, nutrition, and child care as part of the bank's comprehensive social development program.

Established in 1983, Grameen Bank has grown in terms of both members and outstanding loans. In 1994 there were 1,045 Grameen Bank branches covering 2 million members in 35,000 villages (more than half the villages in Bangladesh). Between 1985 and 1993 membership increased 960 percent to 1.8 million members, 98 percent of whom are borrowers. Total loans outstanding increased from 244 million *taka* in 1985 to 11 billion *taka* in 1994. The bank has also mobilized rural savings, which increased from 115 million *taka* in 1985 to 8.97 billion *taka* in mid-1993. The bank has a loan recovery rate of more than 95 percent, the program dropout rate is low, and borrowers save an average of 19 percent of the loan amount they receive.

Leadership was vital in the bank's early stages. But what has mattered in the longer run are features that have ensured the institution's financial viability, such as group-based lending and decentralization, which facilitate close contact with borrowers and ensure their financial viability. These institutional characteristics allow a quick assessment of loan recovery performance and branch profitability; combined with greater on-lending and an increase in the lending rate from 16 to 20 percent, they have reduced the bank's subsidy dependency index from 1.66 percent in 1987 to 0.73 percent in 1993. To eliminate the bank's subsidy dependency altogether, on-lending interest rates would have to increase from 16 to 28 percent given 1993 figures.

About 12,000 NGOs are registered in Pakistan, of which 6,000 exist on paper only and 3,500 are religious NGOs. About 100 NGOs are engaged actively in economic and social welfare.

AGHA KHAN RURAL SUPPORT PROGRAM. The Agha Khan Rural Support Project (AKRSP) is the most important NGO supporting the rural population in Pakistan. Established in 1983 in Gilgit, a remote, mountainous area in the north of Pakistan, the program has three components. At the core is the economic program, which aims to change the incentive structure so that rural households increase their incomes by working harder. Complementing the economic program are the social and technical components. The social program focuses on changing village organization structures to accommodate technical and economic change; the technical program provides skills and techniques needed for social and economic renewal.

The lending program began with a loan from Habib Bank, which was on-lent interest-free with a penalty of 1 percent per month in case of default. Since 1988 a service charge of 10 to 15 percent has been levied on all loans. Credit operations are based on on-lending of funds borrowed by the AKRSP or received from donors. Fertilizer purchase and marketing operations account for 87 percent of the short-term credit provided by the AKRSP; medium-term credit is used for land development and purchase of agricultural machinery. Repayment rates are very high and default is negligible, with only 1.7 percent of short-term loans and 1 percent of medium-term loans in default.

By most criteria the AKRSP has been an outstanding success (table 6.18). It is not clear, however, whether the directed credit under the program has succeeded in disbursing credit. Moreover, the program's mandate may be too broad. In the long run its economic and social programs will expand the demand for credit and overwhelm the program's small managerial staff. The best program design might well be to sponsor two program types: a program focused on credit that does not provide the technical and organizational support needed for economic uplift and a broader program that works in

Table 6.18. *AKRSP Performance in Selected Areas, 1983 and 1988*

<i>Indicator</i>	<i>1983</i>	<i>1988</i>	<i>Percentage change</i>
Number of village organizations	131	993	658
Number of women's organizations	10	248	2,380
Number of training courses conducted per year	4	37	825
Number of projects identified	363	1,346	270
Number of projects completed	23	514	2,135
Percentage of rural households benefiting	12	52	5,100
Deposits by village and women's organizations (Rs. millions)	0.8	51.3	6,312
Credit disbursed annually (Rs. millions)	1	34.6	3,360
Number of credit recipients (thousand households)	4.7	61.0	1,198

Source: World Bank (1990b).

tandem with existing credit institutions to streamline their operations and ensure that borrowers put credit to its best use.

FAMILY PLANNING ASSOCIATION OF PAKISTAN. Since 1984 the Family Planning Association of Pakistan (FPAP) has provided loans to some 2,000 women for income-generating activities. Each year interest-free loans are offered to five to seven women in each of 20 locations. Loan recipients are selected by local women's committees based on their personal knowledge of the applicants' circumstances and attitudes. Loans of Rs 500 to Rs 1,000, made principally for goat rearing, poultry farming, food preservation, tailoring, and small businesses, have a six- to seven-month term and are repaid in monthly installments of Rs 50 to Rs 100. Borrowers pay a nominal monthly membership fee until the loan is repaid in full. Monthly fees are used to provide applicants with skill training.

The FPAP also operates a United Nations Development Programme-funded credit and training program at three locations. Borrowers receive loans for preselected activities based on their skills, market potential, and the FPAP's experience in the area. Women are encouraged to form a loose cooperative with a nominal membership fee. They hold regular meetings and are given training in their respective activities. Loans range from Rs 5,000 to Rs 10,000 at each location. The program has been running very successfully, with negligible defaults. Beneficiaries have expressed their satisfaction with the loan scheme and some are now contributing Rs 500 to Rs 15,000 a month to their family income.

SINDH RURAL WORKER COOPERATIVE ORGANIZATION. The Sindh Rural Worker Cooperative Organization has 5,000 members in 153 villages in 13 districts of the province. Each of the 153 cooperatives is self-financed, self-managed, and has a successful savings and investment program focusing on physical and social infrastructure projects.

Credit for Self-Employment

Unemployment in Pakistan in 1995 was estimated at 2.2 million, of which 63 percent, or 1.4 million, live in rural areas. To mitigate the problems of unemployment and provide opportunities for entrepreneurship, a self-employment program was started in 1992. Participating in the scheme are the National Bank of Pakistan, the Habib Bank Limited, the Small Business Finance Corporation, the Youth Investment Promotion Society, the Punjab Small Industries Corporation, and the Sindh Small Industries Corporation. In addition, the First Women's Bank, the Regional Development Finance Corporation, and the ADBP are operating their own small loans scheme with similar objectives.

From mid-1992 to mid-1994 the Small Business Finance Corporation, Habib Bank Limited, and the National Bank of Pakistan approved loans worth Rs 5.6 billion, creating an estimated 96,057 jobs. The

investment cost per job was Rs 58,000, which compares favorably with a cost of Rs 459,000 per job created in the large and medium sector financed by the Industrial Development Bank of Pakistan, the Pakistan Investment Credit Insurance Corporation, and the National Development Finance Corporation (at a total cost of Rs 6.88 billion for 15,000 jobs) during this period. Loan recovery is 70 percent, higher than the recovery ratio for larger industries.

Information on the rural component of the program is available only for the schemes of the Punjab Small Industries Corporation, which was designed for rural areas, and the Youth Investment Promotion Society, which maintains separate statistics for rural areas. To date Punjab Small Industries Corporation has advanced Rs 1.6 billion for 6,110 projects and created 61,000 jobs, at a total cost of Rs 4.35 billion. Since its inception in 1987 the Youth Investment Promotion Society has approved loans totaling Rs 5.7 billion, creating 63,000 jobs. Current annual lending is about Rs 1 billion, of which 37 percent goes to rural areas, where 43 percent of all jobs were generated. The viability of these programs will have to be examined carefully.

The government recently approved an integrated program for self-employment with a maximum loan limit of Rs 300,000 per individual, an interest rate of 14.5 percent, and repayment over five to seven years. Participating institutions would include the Small Business Finance Corporation, the National Bank of Pakistan, the Habib Bank Limited, the Youth Investment Promotion Society, the First Women's Bank, the Regional Development Finance Corporation, and the ADBP. In terms of investment cost per job and the diffusion of economic benefits the program shows promise. Equality of access should be ensured for rural applicants. Small industrial corporations could be included in the program or ensured adequate credit to continue their schemes for self-employment, and future financing of the program could be linked with recovery and the ability to implement the schemes properly. So that the impact of the program on rural areas can be assessed, separate data should be maintained for rural areas.

Reform of Rural Credit Policy and Institutions

The rural credit market needs to operate efficiently in order to facilitate better performance by the rural economy and to help promote economic growth. Inefficiencies in the rural credit market arise partly because of asymmetric information and imperfect enforcement of loan contracts and partly because of misdirected government interventions. If the financial institutions are to play an important role in facilitating faster economic growth, the rural credit markets must be liberalized. To do so, the role of the SBP needs to be strengthened and rural credit services for smallholders and the poor need to be developed. The government must neither control the financial institutions nor set interest rates. Instead, it should shift its focus to prudential regulation and tighter supervision. At the same time, the financial institutions must liberate themselves from traditional thinking and practices in rural finance and introduce innovative product design to suit the needs of small farm and nonfarm producers.

Along with prudential regulation and supervision, rural financial liberalization would promote efficiency in the rural credit market, although specialized programs and institutions would also be needed to deliver credit to small producers and the poor. Such programs should be developed so that they are financially viable.

Guiding Principles for a Rational Rural Credit Policy

A rational rural credit policy should adhere to the following guidelines:

- The government should replace current policies that result in financial repression with policies for prudential regulation and supervision accompanied by strong measures for macroeconomic stabilization.
- A competitive environment should be ensured for commercial banks, which must be allowed to set interest rates to cover transaction costs of rural lending so that they can better serve the financial needs of commercial and large borrowers in rural areas.

- Credit should be made available to support productivity growth among agricultural smallholders and small producers in the rural nonfarm sector. Because of small loan size, the transactions costs of lending to small rural borrowers are high, and commercial banks may not be willing to extend credit. When smallholders constitute the bulk of the farming community and small producers account for the majority of rural nonfarm producers, specialized institutions need to be created outside the government with help from the NGOs or private groups. These institutions must be innovative and overcome the market failure that arises from high transaction costs of small loans.
- Credit should be made available to the rural poor and to women for consumption smoothing and for promoting sustainable income-generating activities. Because of the perception that the poor and women represent high credit risks and have no physical collateral, commercial banks may not advance loans to them, even if traditional rural finance practices are liberalized. Specialized financial institutions may be necessary to meet the credit needs of these segments of the rural population.
- The capital base must be unencumbered so that specialized financial institutions can provide credit to smallholders and the poor. This capital base can be built either by subscribed capital from the government or interested donors, or from retained earnings from operations. Such capital will help to absorb initial start-up costs. When the market fails to meet credit needs of the disadvantaged sector, paid-up capital to subsidize initial transaction costs is necessary to help establish such financial institutions. These funds should be provided on conditions that will ensure the self-sustainability of these institutions.
- Ultimate borrowers should pay the market interest rate. Interest rates should never be subsidized, even if credit is targeted. Lending at below market rates will cause the powerful and the more affluent to divert these resources to meet their own needs. Exclusion of nontarget households or sectors must be ensured through program design. Program participation should be made so expensive for nontarget households that they find it unprofitable to participate in specialized financial programs targeted at the rural poor.
- The criteria for the inclusion of target households in the program of specialized institutions (small loans, group accountability, group pressure) should lead to self-selection. By self-selecting borrowers, the program will make loans available only to borrowers who are most likely to use credit productively and who are best able to generate income and hence repay the loan. Self-selection would promote borrowers' financial viability as well as loan repayment.
- Policy interventions that create special lending institutions to meet the credit needs of small producers and the poor must be subject to conditions—namely, adequate loan recovery, market interest rates, and mobilization of deposits—that require their financial viability by reducing their dependency on subsidized funds.
- When scarce resources are targeted to special groups, such as smallholders, small nonfarm producers, the poor, or women, transparent criteria must be established to continuously evaluate and monitor the performance of both the targeting agencies and their clients.

Rural finance must be seen as an integral part of equitable development within a framework of macroeconomic stability. The policy thrust should be toward financial liberalization subject to prudential regulation and supervision by the SBP. Subsidies should be transparent, sharply focused to subsidize only financial and institutional costs, and subject to phasing out. No lending should be undertaken at interest rates below those charged to prime customers. The essence of a progressive policy lies not in pushing money at people but in improving their bankability and the productivity of their enterprises. Above all, the viability of the financial system must not be jeopardized for short-term political gains.

Policy Recommendations

The policy recommendations encompass the framework for the overall financial sector, assisting disadvantaged borrowers in obtaining credit and improving the operations of existing institutions.

PRUDENTIAL REGULATIONS. In rural finance the government should acknowledge that it controls neither financial products nor interest rates. Government intervention in the rural credit market should be limited to prudential regulation and supervision, which will have to be ensured and enforced before liberalization is carried out. Prudential regulatory and supervisory policies include promotion of legal, administrative, and financial discipline, particularly the enforceability of contracts, timely recovery of loans and dues, restraints on use of personal discretion in financial dispensation, and full disclosure of business information to and by the financial institutions.

The need for prudential regulation and supervision arises from the role of the banks as trustees of money belonging to depositors. Prudential regulation and supervision can help prevent the collapse of the financial institutions because of mismanagement, overambitious investment, or fraud. Prudential regulation will restrict banks' entry on a selective basis (licensing of banks), ensure adequate capital deposit ratios, maintain adequate liquidity in the system, ensure adequate provision for bad loans, and allow for early intervention in cases of impending bank failure. These prudential policies must be supported by measures that provide an adequate legal framework for loan recovery, make bank management accountable, institute standards for audit by the SBP, and provide government support to minimize loan delinquency and avoid the chances of fiscal liability, the pressure for which increases when such financial institutions go under. Financial institutions have already accumulated more than Rs 80 billion in overdue loans. Even if some of the financial institutions are privatized, the government will still bear responsibility for ensuring adequate recovery. This is not merely a legal or administrative matter; transition from default to discipline is more like a cultural change, requiring total transformation and government commitment. The government must continue to mount special efforts to recover overdue loans.

With the exception of providing prudential regulatory and supervisory policies, the government must leave the banking system primarily to the private sector. Although public sector banking has facilitated the implementation of state policies, experience has shown that such policies could have been implemented more efficiently by the private sector without risking viability. A liberalized system would be more conducive to innovation for resource mobilization and competitive efficiency.⁴

PRIORITIZING CREDIT DELIVERY. Although market forces are efficient in allocating and distributing resources, they do not always meet social objectives such as the alleviation of poverty. Commercial banks will continue to meet the credit needs of the richest 10 percent of rural households, households that own more than 25 hectares of land. The provision of financial services to this group will be more efficient and effective with the liberalization of interest rates and special programs directed at largeholders will not be necessary (see box 6.4).

Priorities for certain disadvantaged groups may be needed where the market does not adequately address their needs. A focused priority program for rural finance could be undertaken without jeopardizing the growth or efficiency of the financial system. Prioritization of rural activities may be necessary for several reasons. First, the long-term potential gains from some economic activities do not translate into short-term gains for the actors. Second, some activities (such as physical and social infrastructure) have substantial economic benefits but are not commercial in nature. Finally, the financial institutions' heritage of asset-based rather than project-based lending predisposes them to an orientation that may not be effective for certain groups of rural producers (such as the assetless poor).

The priority sectors for targeting are smallholders with 10 acres or less; nonfarm activities of a non-commercial nature, such as livestock, fishery, forestry, and range lands; microenterprises; and poor rural women. These sectors deserve special attention in the interest of reducing poverty, promoting broadly based development (through diversification of crops and rural economy), slowing rural-urban migration, and establishing meaningful linkages between the rural and the urban economy.

4. Note that interventions should be carefully crafted so that they address disadvantages arising from credit market failure.

Box 6.4. Should a Directed Credit Program Be Established for Largeholders?

Whether or not largeholders would continue to have access to commercial credit in the absence of government intervention is a much debated issue in Pakistan. Those who argue against complete liberalization on the grounds that liberalization would completely dry up commercial credit to large farmers include bankers as well as farmers, who argue that liberalization would not work for the following reasons:

- The Land Alienation Act that governs the terms under which agricultural land can be transferred makes it difficult to use land as collateral against the risk of default. This problem is compounded by poor land registration practices.
- Because farming methods are not streamlined, yield estimates and the risk of crop failure are hard to assess. It is difficult to project income and profitability of a farming enterprise (as it currently stands); the absence of crop insurance compounds this problem.
- The transaction costs of dealing even with large farmers are high because farmers are widely dispersed and bank branches are not always conveniently located. Moreover, land may be divided into several parcels spread over a large geographical area, which makes monitoring performance difficult.
- In Pakistan's political economy large farmers are extremely well connected, making loan recovery difficult and acquisition of assets in case of default impossible.

Opponents of liberalization also argue that interest rates that incorporate a hefty risk premium would lead to the well-known problem of adverse selection because higher-risk farmers would bid away loanable funds.

Proponents of complete liberalization of commercial credit argue that all of these hurdles are consequences of paternalistic government intervention in rural finance. Nearly half a century of directed subsidized credit has promoted irresponsible borrowing habits. After liberalization credit might initially be available only to those large farmers who have organized their farms along commercial lines. In time this would encourage others to follow similar practices to make themselves creditworthy. Those who chose not to modernize might be denied credit (or would have to pay a high risk premium to obtain it) and would eventually have to sell their land, contributing to the development of a market for land. Income from land would be taxable, bringing the agriculture sector into the fold of the modern economy.

How much credit would be needed to support these priority groups? Total resources needed for targeted rural credit are estimated at Rs 12.8 billion (table 6.19), less than the Rs 15.5 billion these institutions currently lend to agriculture in their untargeted programs. At the 1993 level the savings of Rs 2.7 billion would be available to retire bad debt and make the institutions financially viable for targeted lending.

Smallholders operating farms of 10 acres or less represent 60 percent of the farming community and contribute 40 percent of agricultural GDP. Assuming constant returns their need for agricultural credit to support a 1 percent rate of agricultural growth would be the same as that of largeholders. Assuming that small and large farmers have the same savings rate (5 percent) the credit need for smallholders is calculated to be 40 percent of the total credit needed to support a 1 percent rate of agricultural growth. Thus, the needed policy-directed agricultural investment credit ranges from Rs 4.2 billion to Rs 24 billion to support agricultural growth of 4 to 8 percent (table 6.20). The production credit requirement of smallholders is also calculated at 40 percent of the production credit requirement for all farmers, or Rs 2.0 billion and Rs 4.2 billion for each of the growth scenarios. Thus, the total agricultural credit requirement ranges from Rs 6.2 billion to Rs 28.1 billion. The associated budgetary support would be small, however, because credit would not be lent at a subsidized lending rate but would involve higher transaction costs to target credit. The subsidy associated with the higher transaction costs would be about 10 percent of actual lending and would range from Rs 620 million to Rs 2.8 billion.

The 1985 *Rural Credit Survey* found that the need for consumption credit represents about 24 percent of total credit. For simplicity it is assumed that this proportion holds for institutional credit. According to the 1985 survey 56 percent of rural credit is needed for agricultural purposes. Assuming that these proportions hold for poor rural households, total annual rural credit needed by poor rural households for agricultural purposes is estimated at Rs 11.1 billion (Rs 6.2 billion divided by 0.56) for the low-growth scenario. The

Table 6.19. Annual Policy-Directed Rural Credit Need Under Low-Growth Scenario
(billions of 1993 rupees)

<i>Target group or purpose</i>	<i>Low-growth scenario</i>
Smallholders	6.2
Investment	4.2
Production	2.0
Consumption smoothing	2.7
Microenterprises	2.2
Women	1.7
Total	12.8

Source: Authors' estimates.

Table 6.20. Smallholders' Annual Need for Agricultural Investment
(billions of 1993 rupees)

<i>Agricultural growth rate</i>	<i>2% investment aggregate GDP required</i>	<i>3% investment aggregate GDP required</i>
4%	4.2	9.8
6%	9.8	14.7
8%	15.4	24.0

Source: Authors' estimates.

consumption credit need of poor rural households provided by institutional sources is estimated at Rs 2.7 billion (24 percent of the total institutional credit need) under the low-growth scenario. Under the high-growth scenario farm incomes would rise and the need for consumption credit would decline.

The 1985 *Rural Credit Survey* projects the credit need of rural enterprises at 20 percent of total credit. Rural microenterprises' need for credit is estimated at Rs 2.2 billion under the low-growth scenario. Under the high-growth scenario nonfarm business activities are likely to increase, resulting in greater need for credit finance.

The 1991 Federal Bureau of Statistics estimated that 1.7 percent of households are headed by rural women. This figure seems low and certainly understates the contribution of women to household income. More recent work, based on the 1989 Applied Economic Research Center/World Bank survey, directly estimates the contribution of women to household income at 13.3 percent (Mujahid-Mukhtar and Hassan 1992). Extrapolating from this figure, 15 percent of agricultural GDP of the poorest 40 percent of rural households can be assumed to be contributed by women, suggesting that women should receive at least 15 percent of the credit targeted at the rural poor, or about Rs 1.7 billion.

Recommendations for Improving the Operations of Existing Financial Institutions

The major institutional players in rural finance are the commercial banks, the cooperative societies and banks, and the ADBP. As a result of misdirected policy interventions, these institutions do not operate efficiently. Recommendations for improving the operations of each of these groups are made in the following sections.

AGRICULTURAL DEVELOPMENT BANK OF PAKISTAN. Because of poor management practices and the low rate of loan recovery, the margin between interest income and the cost of financial intermediation by the ADBP has been negative or zero for years. To become financially viable the bank should carry out a thorough

portfolio audit. A crucial starting point is an in-depth audit of its loan, equity, and liquid asset portfolio, covering not just the valuation and examination of the quality of the assets but assessment of the credit and portfolio management policies and practices that determine the quality of the portfolio, and an analysis of the regulatory and supervisory environments that influence the conduct of corporate policies and practices. The portfolio audit should not represent a mere examination of the bank's financial accounts, schedules, and statements, although financial examination and audit techniques and methods will necessarily be employed to permit analysis of the bank's financial condition and performance. Rather, the portfolio audit is meant to be a comprehensive examination, analysis, and assessment of the credit, portfolio management, financial management, and risk management policies, operations, and practices of the bank that directly bear on the condition and performance of its loan, equity, and liquid assets.

The portfolio audit should provide an analysis and assessment of the following areas:

- Performance of the bank's loan, equity, and liquid asset portfolios and the impact of the portfolio performance on the bank's overall financial condition and performance over the past ten years
- Conduct of the bank's credit and investment process and operations
- Conduct of the bank's portfolio supervision and management function
- Management of the bank's credit, investment, liquidity, interest rate, and foreign exchange risks
- Management of the bank's financing.

Subsequent reforms will depend on the results of the portfolio audit. If the organization is found to be financially unviable, drastic actions, such as liquidation and transferring loans to a collection agency, will have to be considered. If a major restructuring of the portfolio (such as transferring bad loans to a collection agency) can lead to viability, the bank should be freed from government control by being permitted to sell shares to the private sector. The government share could be reduced over time, allowing private shareholders (including farmers' representatives) to fully control its management. The new institution would work under the regulation and supervision of the SBP.

COMMERCIAL BANKS. Growing evidence suggests that personal and less stringent collateral is as secure as immovable property. Banks should begin to accept hypothecation of gold and jewelry, hypothecation of crops and machinery, and pledging of inventories and personal guarantees as collateral.

The effect of the pass-book system on rural lending has been negligible: 16 years after this system was introduced 9 percent of farmers have been provided passbooks, which were used in 37 percent of farm loans. Reliance on the system should be reduced. If passbooks are used as a form of guarantee for bank loans, a special program may have to be initiated for their speedier issue.

Commercial banks should follow SBP regulations on credit discipline, adequacy of provisions for bad and doubtful debts, and improvement of debt-equity ratios. Adherence to these policies would improve financial security and help promote better credit discipline.

Banks must be judged both on the resources they mobilize from rural areas and on the resources they channel to the rural sector. Commercial banks currently mobilize more deposits from rural areas than they lend to these areas. According to one estimate, commercial banks provide only 12 percent of the resources they mobilize from rural area on-lending (after keeping 35 percent as cash reserves). The banks must diversify their lending portfolios, extend loans for short-term production and long-term investment in both crop and noncrop production, and encourage investment in agroprocessing to support agricultural modernization.

To increase credit in the rural sector, commercial banks could experiment with wholesaling credit through input suppliers and marketing agents as well as through NGOs to reduce the transaction cost of commercial lending. They could also offer extension services.

Successful commercial lending is, of course, contingent on prompt and effective recovery of loans. Loan recovery requires a transparent system of property rights and effective enforcement of contracts. The legal procedures for loan recovery from defaulters should be fast and effective. Branch managers should have the authority to recover overdues in the same manner as arrears of land revenue. The system of

lending should be transparent so that borrowers who default are not able to borrow from a different bank. Without a proper and effective enforcement mechanism for recovery of loans—through disposing of land pledged as collateral, for example—few commercial banks will be willing to lend to large farmers without intervention from the government. To facilitate lending by commercial banks, the government should improve the legal framework so that other assets of large farmers could be effectively used as collateral.

COOPERATIVE BANKS AND SOCIETIES. The cooperative movement in Pakistan has been subject to abuse by vested interests dominated by large and affluent farmers. The availability of finance at subsidized rates has sapped the capacity of the system to mobilize its own resources and build membership on the basis of cooperative principles. The movement must be revamped and made subject to the tests of profitability and sustainability. Several principles are critical. First, the cooperative movement must be reorganized so that it can work toward achieving its objective of promoting thrift and savings by pooling resources. Second, the movement must be financially viable. The basic building block of the cooperative movement is the village-level cooperative society, which is not financially viable. Smaller societies based at the village level should be federated into Union Council cooperative societies so that small groups can monitor their performance and create group pressure to repay the loan. Third, the village-level society must be responsible for repayment of loans to individual society members. If any society member defaults on a loan, the entire village society should become ineligible for further loans. Similarly, if any member fails to repay the Union Council-based society, the society should lose its registration. A system that operates in this way is the Bangladesh Rural Development Board's RD-12 project, in which members of primary societies are organized into smaller "solidarity groups." Fourth, the village cooperative societies must be activity-based and the societies must be broadened to include the noncrop subsector (livestock, fishery, poultry). Rural residents involved in nonagricultural activities, including microenterprises and ancillary services, such as input supplies, processing, marketing, and storage, and rural artisans, tenants, and landless laborers should be allowed to form their own societies. Section 17 of the Cooperative Societies Act must be amended to permit these changes. Fifth, participation in village-level societies must be self-selective so that the small groups formed at the village level are homogenous. Each village-level society meets weekly to collect mandatory deposits and conduct other society activities. Union-level meetings are held once a month to discuss loan proposals and the performance of the village-level societies. All transactions at the union level must be transparent and no vested interest should be allowed to jeopardize the registration of the societies. Sixth, more stringent criteria for registration of these societies should be set for minimum membership, deposits, and share capital. Finally, the societies must be allowed to determine the criteria for loan eligibility, loan appraisal procedures, loan ceilings, selection of activity, disbursement, and loan recovery.

The cooperative movement also needs to be restructured. Both at the provincial and federal level the cooperative banks need to be reorganized in order to make them more responsive to member needs. They must be subject to tighter financial discipline and must improve the quality of management through staff training, greater decentralization and autonomy, and improved performance incentives at the individual and institutional levels. Currently the Provincial Cooperative Banks act simply as credit disbursement agencies of the Registrar of the Cooperative Department. For transparency in financial and administrative matters, the Cooperative Department and the Provincial Cooperative Banks must be separated. The Cooperative Department should concentrate on its main functions of registration, regulation, auditing, and dissolution. The Provincial Cooperative Banks should be headed by professional bankers and perform regular banking functions, such as loan appraisal, authorization of loans, establishment of loan ceilings by activity, loan administration and follow-up, and loan recoveries.

Under the current system both the Provincial Cooperative Banks and the Federal Cooperative Bank rely exclusively on the SBP for funds. The Federal Cooperative Bank receives credit from the SBP at 0.5 percent and passes it on to the Provincial Cooperative Banks at 3 percent. The Provincial Cooperative Banks charge 11 percent to society members, leaving a margin of 8 percent to meet the cost of financial intermediation, which is high because of the low loan recovery rate. Both the Provincial Cooperative

Banks and the Federal Cooperative Bank must raise resources from external sources for on-lending. The Provincial Cooperative Banks must increase the loan recovery rate to reduce the cost of financial intermediation. Emphasis should be on attaining the long-term viability of these societies and the cooperative banks, not on using them to provide cheap credit to society members.

SPECIALIZED PROGRAMS AND INSTITUTIONS FOR SMALL BORROWERS. The failure of the ADBP, commercial banks, and cooperative banks to reach smallholders, the landless poor, and other small producers in rural areas clearly indicates a market failure in rural finance. The failure is caused partly by high transaction costs and partly by weakness in program design. The experience of Grameen Bank in Bangladesh, and its replication elsewhere, clearly shows that it is possible to serve poor and small borrowers on a sustainable basis. Subsidized funds must be used, not to subsidize interest rates, but to partially subsidize the costs of financial intermediation and institutional development during the five years it takes for a branch to function on its own.

The Grameen Bank experience shows that targeted credit can alleviate a particular form of credit market failure for the poor and increase the human and physical capital of the poor (see box 6.3). Over time the bank reduced the government's share of equity from 60 percent to 10 percent as members purchased shares. The bank is subject to regulation and supervision by the central bank. Pakistan has been considering a Grameen Bank-type institution for smallholders and the poor in rural areas since the late 1980s. Group-based lending has proved successful where formal markets have failed and the government should test the model in Pakistan on a pilot basis. A group-based bank could also be used in Pakistan as a platform for social intermediation and agricultural extension.

The government of Pakistan might also create a Poverty Alleviation and Smallholders' Development Fund to provide subsidized funds not only to the proposed specialized bank but also to NGOs, commercial banks, and cooperative banks that provide financial services to the poor and smallholders. These subsidized funds, which would be provided for a limited time only, would be used to develop institutions that would provide credit to the targeted group; the funds would provide the start-up capital for programs that would otherwise not be able to operate on a competitive basis. The ultimate borrowers would pay market interest rates.

Appendix

Estimating Agricultural Savings

The three principal forms of agricultural savings estimated here are self-financed investments in agriculture, bank deposits held by the noncorporate agricultural sector, and currency holdings. Agricultural investments as measured by private fixed capital formation rose dramatically between 1985 and 1994. The series reported in column 2 of table 6.1A is a slightly adjusted version of the series reported in government statistics. It assumes that official data underestimate actual capital formation by 10 percent because of inadequate coverage. The reported series reflects this adjustment and shows that fixed capital formation hovered around 4 percent between 1974 and 1980 and then increased rapidly between 1981 and 1984 (figure 6.1A). Between 1985 and 1993 the rate of fixed capital formation as a percentage of agricultural GDP varied between 6 and 8 percent. Direct evidence on purchase of agricultural machinery and tubewells corroborates this trend.

Not all of the additional investment in agriculture can be attributed to higher savings (figure 6.2A). Since the late 1970s Pakistan's credit policy substantially increased credit for agriculture by increasing lending targets of the nationalized commercial banks, allocating more credit to the ADBP and initiating lending at zero mark-up. As a result total bank advances to agriculture increased rapidly, from an average of Rs 320 million a year between 1974 and 1980 to an average of Rs 3 billion a year between 1984 and 1994.

Savings may also be held in the form of bank deposits. Direct evidence on rural bank deposits is not available, although rural deposits are believed to constitute nearly 30 percent of total bank deposits.

Table 6.1A. Investment and Savings in Agriculture, 1974-93

Year	Millions of rupees					Own investment
	Investment	Advances	Deposits	Currency holdings	Agricultural GDP	
1974	938.7	96.0	307.0	127.3	33,533	842.7
1975	1,496.8	1,432.0	857.0	442.7	38,338	64.8
1976	1,776.0	878.0	544.0	554.8	43,845	898.0
1977	2,160.7	—	1,423.0	529.5	50,311	2,157.7
1978	2,291.0	665.0	867.0	1,032.7	53,915	1,626.0
1979	2,736.5	321.0	1,009.0	741.8	62,430	2,415.5
1980	3,060.4	325.9	—	1,349.2	76,399	2,734.5
1981	5,117.1	419.5	—	551.0	92,216	4,697.6
1982	6,628.9	-418.5	—	1,542.2	99,380	7,047.4
1983	8,168.5	1,128.1	3,191.2	1,191.7	104,550	7,040.4
1984	7,967.7	2,817.3	1,304.8	837.5	121,293	5,150.4
1985	9,036.5	4,516.1	1,917.0	1,297.5	128,801	4,520.4
1986	10,047.7	5,891.1	5,437.9	2,171.1	135,308	4,156.6
1987	11,183.8	8,002.5	4,457.7	2,485.6	156,357	3,180.8
1988	12,999.2	3,469.9	2,876.3	1,847.4	184,074	9,529.3
1989	15,463.4	5,832.1	3,195.9	3,336.2	197,441	9,631.3
1990	16,526.8	2,691.2	1,632.3	4,161.0	233,130	13,835.6
1991	16,462.4	1,138.6	4,352.6	3,821.9	282,374	15,323.8
1992	18,460.4	2,908.8	6,979.2	2,858.6	297,816	15,551.6
1993	19,822.4	623.1	2,251.3	3,432.4	349,592	19,199.3
1974-80	620.2	834.5				
1983-93	3,547.2	3,417.8				

(table continues on following page)

(Table 6.1A continued)

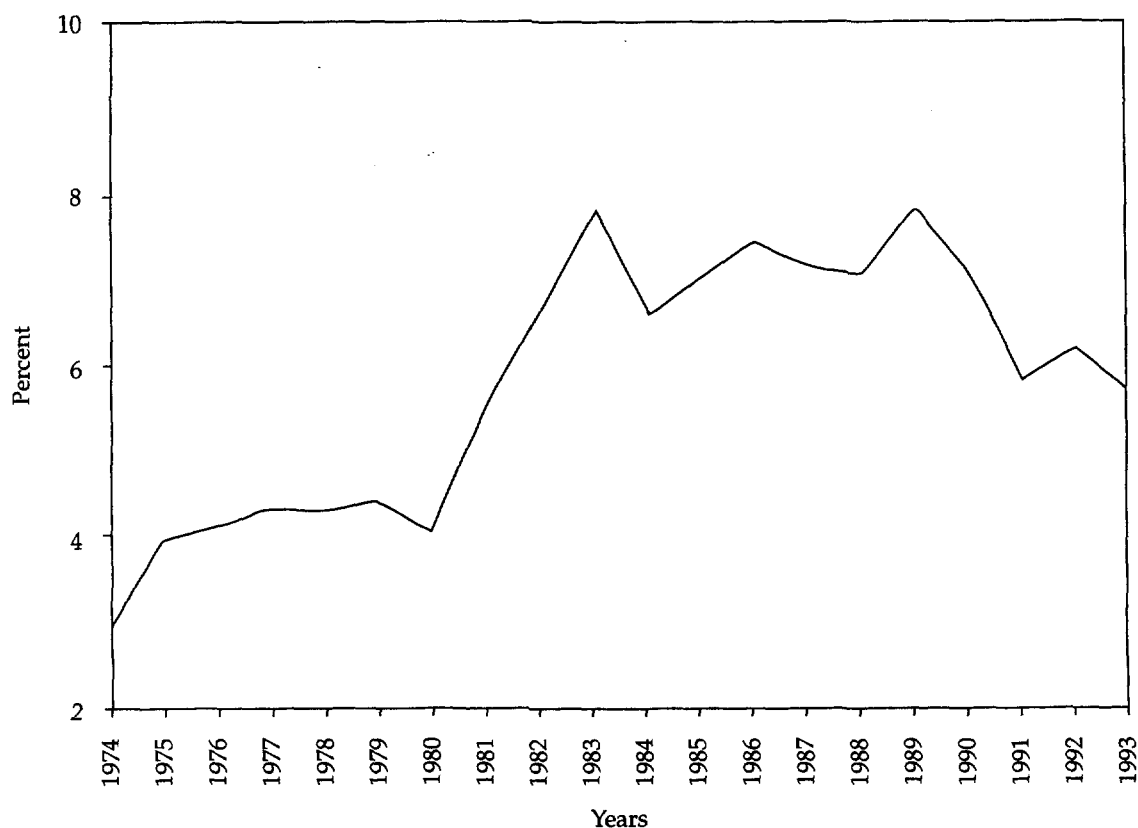
Year	Percentage									
	Own investment/ agricultural GDP	Deposits/ agricultural GDP	Rupees/ agricultural GDP	Savings/ agricultural GDP	Deposits/ advances	Agricultural investment/ agricultural GDP	Own investment/ agricultural investment	Advances/ agricultural GDP	Advances/ agricultural investment	Investment and savings in agriculture
1974	2.51	0.92	0.38	3.81	3.20	2.80	0.90	0.29	10.23	89.77
1975	0.17	2.24	1.15	3.56	0.60	3.90	0.04	3.74	95.67	4.33
1976	2.05	1.24	1.27	4.55	0.62	4.05	0.51	2.00	49.44	50.56
1977	4.29	2.83	1.05	8.17	—	4.29	1.00	0.01	0.14	99.86
1978	3.02	1.61	1.92	6.54	1.30	4.25	0.71	1.23	29.03	70.97
1979	3.87	1.62	1.19	6.67	3.14	4.38	0.88	0.51	11.73	88.27
1980	3.58	—	1.77	—	—	4.01	0.89	0.43	10.65	89.35
1981	5.09	—	0.60	—	—	5.55	0.92	0.45	8.20	91.80
1982	7.09	—	1.55	—	—	6.67	1.06	-0.42	-6.31	106.31
1983	6.73	3.05	1.14	10.93	2.83	7.81	0.86	1.08	13.81	86.19
1984	4.25	1.08	0.69	6.01	0.46	6.57	0.65	2.32	35.36	64.64
1985	3.51	1.49	1.01	6.01	0.42	7.02	0.50	3.51	49.98	50.02
1986	3.07	4.02	1.60	8.70	0.92	7.43	0.41	4.35	58.63	41.37
1987	2.03	2.85	1.59	6.47	0.56	7.15	0.28	5.12	71.56	28.44
1988	5.18	1.56	1.00	7.74	0.83	7.06	0.73	1.89	26.69	73.31
1989	4.88	1.62	1.69	8.19	0.55	7.83	0.62	2.95	37.72	62.28
1990	5.93	0.70	1.78	8.42	0.61	7.09	0.84	1.15	16.28	83.72
1991	5.43	1.54	1.35	8.32	3.82	5.83	0.93	0.40	6.92	93.08
1992	5.22	2.34	0.96	3.82	2.40	6.20	0.08	0.98	15.76	84.24
1993	5.49	0.64	0.98	7.12	3.61	5.67	0.97	0.18	3.14	96.86
1974-80	3.96	1.74	1.25	5.55	1.77	4.61	0.82	1.37		
1983-93	5.81	1.90	1.45	7.43	1.55	7.99	0.81	2.18		

— Not available.

Note: Investment figures have been slightly adjusted based on annual reports of banks dealing in agricultural credit.

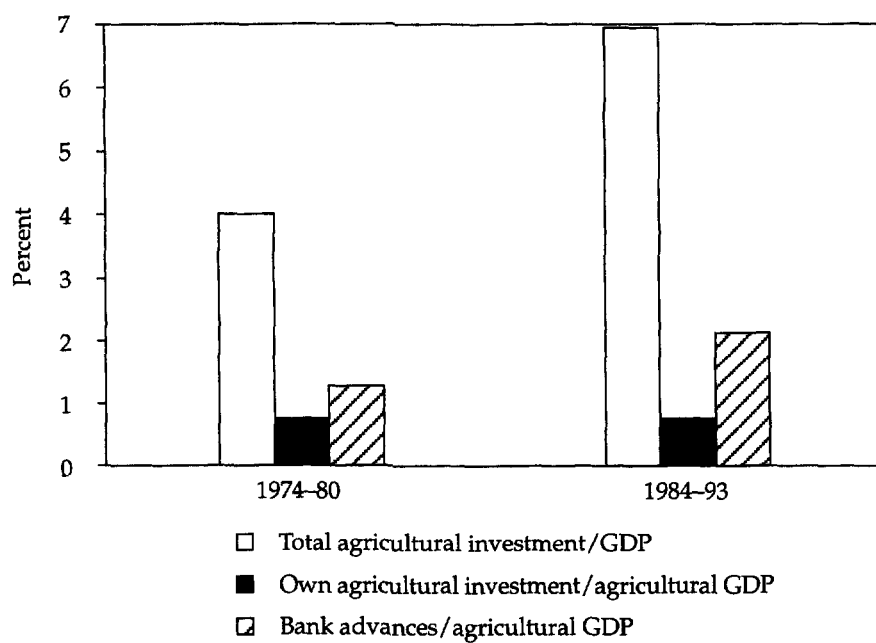
Source: Government of Pakistan, *Economic Survey*, various years.

Figure 6.1A. Private Fixed Capital Formation in Agriculture, 1974–93
(percentage of agricultural GDP)



Source: Table 6.1A.

Figure 6.2A. The Structure of Investment, 1974–1980 and 1984–93



Source: Table 6.1A.

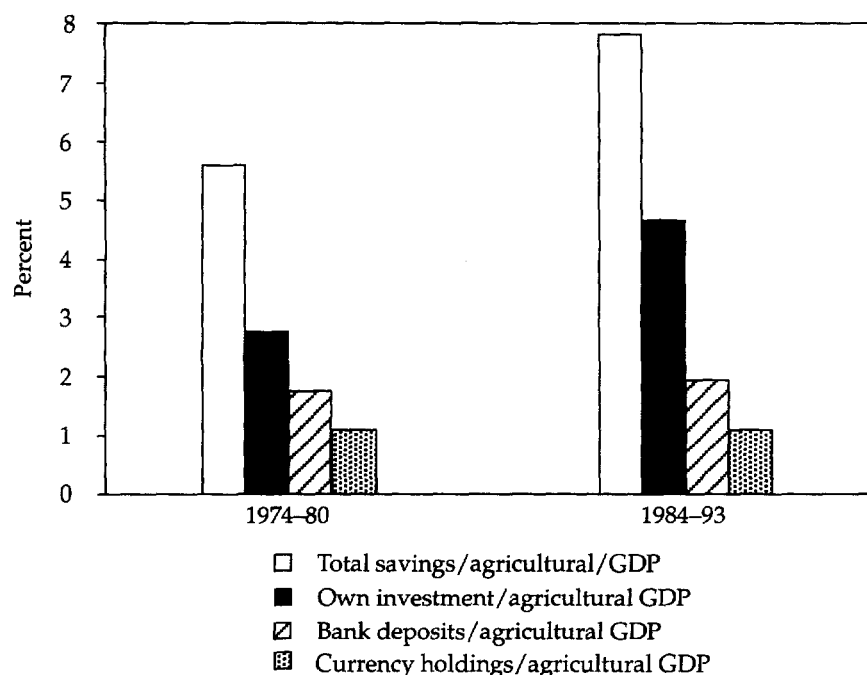
Rural bank deposits increased from an annual average of Rs 834.5 million between 1974 and 1980 to an annual average of Rs 3.4 billion between 1984 and 1993 (table 6.1A).

Currency holdings are a liquid form of household assets. Year-to-year changes in currency holdings represent household savings. To calculate this form of savings it is assumed that changes in currency holdings by rural households represent about 20 percent of the change in currency holdings by the non-financial private sector. Table 6.1A shows currency holdings averaged Rs 2.5 billion per year.

The structure of savings has changed in recent years (figure 6.3A). Between 1974 and 1980 capital formation in agriculture accounted for half of all savings. This share increased to 60 percent between 1984 and 1993. The importance of deposits and currency holdings declined somewhat in the early 1990s, although bank deposits remain the preferred mode of savings.

The rural savings rate can be calculated by adding the three components of rural savings and dividing the total by agricultural GDP. Between 1984 and 1993 the savings rate averaged 7.8 percent, up from 5.6 percent between 1974 and 1980. What accounts for this increase in rural savings? First, rural incomes increased in the early 1990s because of higher agricultural prices and improved yields. Second, the flow of remittances into rural areas (from family members working in the oil-rich countries of the Middle East) increased the cash holdings of rural households. Third, land values increased substantially between 1980 and 1995, increasing rural wealth. Finally, the increased availability of tractors and tubewells has reduced the uncertainty associated with farming by reducing the time between crops and by smoothing out the availability of water, improving prospects of returns to agricultural investments.

Figure 6.3A. *Structure of Rural Savings, 1974–80 and 1984–93*



Source: Table 6.1A.

7

Developing a Comprehensive Strategy for Reform

Rashid Faruquee

Given the problems facing agriculture in Pakistan, what policies and programs should the government adopt to sustain and improve agricultural growth? Before specific strategies are adopted, the appropriate role of the government should be clearly defined as limited to the encouragement of a smoothly functioning market through institutional and regulatory reforms that facilitate private sector activities and market efficiency. In cases where market failure is not an issue and intervention has led to market inefficiency, the best strategy is to reduce the government's role through policy reforms and the strengthening of market liberalization. Thus, intervention failures should not result in a situation that is worse than one without intervention.

Recognizing the Role of the Private Sector

A key component of the government's strategy must be to reshape investment and public expenditure on agriculture. Spending should be focused on the provision of public goods and the correction of market failures, not on activities better suited to the private sector, even if such activities may be profitable. In areas such as poverty alleviation and environmental protection, where the government has a legitimate role to play, market-friendly policy reforms should be adopted to ensure economic efficiency and growth and to achieve the government's social goals.

Changing Policies Affecting Incentives

Policies that affect incentives distort both input and output markets and result in a suboptimal allocation of resources. Changes in price policy, trade policy, and fiscal policy are needed if agriculture in Pakistan is to continue to grow.

PRICE POLICY. As part of structural reform agricultural output prices should be determined by the market, thereby allowing market signals to be transmitted to farmers without distortion. The government should remove all price supports and controls, not only because they distort market signals and represent a drain on the budget, but also because such liberalization will improve production incentives for crops in which Pakistan has a comparative advantage. Price fluctuations that result from market liberalization can be stabilized by other means, such as promoting on-farm storage, private sector storage, and futures trading.

The government should also consider ending the subsidy on wheat imports. Such a policy change would likely have little effect on consumers, because the price of flour is already determined by the market and is close to import parity. It would, however, help farmers by moving the producer price of wheat toward the import parity level. At the same time the government would need to eliminate quantitative import restrictions on wheat and flour. Another desirable step would be to remove protection of sugarcane by eliminating support prices and sugar import restrictions, thus allowing scarce resources (such as water and land) to be used more productively.

Before it removes price supports, the government must ensure that a competitive and efficient private sector is ready to step in as it withdraws. Where competition is not possible, as in sugarcane processing, for example, strict regulation of the monopoly will be necessary. If emerging monopolies are not adequately regulated, the move toward privatization will be discredited and the reform process will suffer.

TRADE POLICY. Rather than striving for self-sufficiency in industrial output, Pakistan should direct its resources to their most efficient uses across sectors and exploit agriculture's comparative advantage to finance import requirements. Trade policy reform, which must be completed rapidly, should be structured so that products in which Pakistan has a comparative advantage are not penalized and products in which Pakistan lacks a comparative advantage are afforded no protection. In particular, the government should consider removing taxes on cotton exports, duties on sugar imports, and quantitative restrictions on both. Any loss of revenue could be offset by eliminating the wheat subsidy. In addition, the sectoral terms of trade could be improved for agriculture by reducing industrial protection. Experience in other East Asian economies shows the considerable benefits of a much smaller bias against agriculture in trade policies. Ideally, the current system of high and heterogeneous duties and barriers should be replaced with a uniform duty (World Bank 1992b).

FISCAL POLICY. Tax reform will need to ensure that all sectors are treated equally in terms of the tax burden. All special agricultural tax exemptions should be eliminated, especially once intersectoral transfers have taken place following the removal of distortions. The system of agricultural income and wealth taxation that has been proposed should be put in place as soon as possible and extended to meet the goals of equity and efficiency. The tax base should be periodically reassessed to ensure that the poor are not taxed too heavily and that taxes do not create intersectoral distortions and inequity.

Changing Policies Affecting Input Markets

The government should consider reducing its level of intervention in agricultural input markets, as it has begun to do in privatizing urea production and distribution. Additional efficiency could be achieved by making the National Fertilizer Corporation more commercially oriented or by divesting it to the private sector.

Privatizing the import of phosphatic fertilizer should be accelerated. The ability of the private sector to take over imports effectively will depend on its being able to compete fairly with the government during the transition. Given the strategic importance of fertilizer, the government should strive to ensure that private firms are given the same facilities as the public sector. A smooth transition to a market dominated by the private sector may also require the elimination of public sector imports. Policy reform in other sectors will likely include removal of price controls on natural gas and fertilizer, which is likely to lead to price increases that reflect full economic pricing.

Government involvement in the marketing of improved (certified) seed is unwarranted and should be ended. Government seed corporations should be run along commercial lines and privatized as soon as possible. In the meantime private firms should be given the same facilities as public sector companies. A legitimate role for government does exist in providing quality control and certification of seed; this role needs to be fully funded and strengthened as use of improved seed increases.

The irrigation system should be decentralized. At the distributary level downstream operations and maintenance should be handled by water user associations, which should provide timely and efficient water delivery. Upstream, at canal command (areas covered by main and branch canals), operations should be handled by commercially oriented public utilities that enter into explicit contractual obligations with the user associations. At the provincial level autonomous water authorities should be responsible for major provincial storage, link canals, off-farm and provincial drainage, and flood control and management.

Irrigation charges can be raised to reflect the cost of service provision, the quality of service provided, and the cost of competing alternatives. Disputes between the different groups using the irrigation system

could be resolved by powerful, politically unbiased regulatory authorities. A legal and institutional framework for the market exchange of water rights could also be established. Although off-farm drainage (a true public good) must continue to be the responsibility of the government, its costs can be recovered from farmers.

A careful study of the costs and benefits of land reform should be initiated. Some immediate measures, such as elimination of low machinery prices and improved access to credit, the lack of which makes it difficult for small farmers to expand their holdings, should be adopted to correct land market distortions. Removing these distortions would increase opportunities for farming and for wage labor on employment-intensive farms. The land title process should be modernized and streamlined through the establishment of a system of permanent title deeds to land. Security of tenure should be ensured without creating new disincentives to rent out land. These measures would likely facilitate long-term investment, especially investment in natural resource management.

Directed credit in any form should be eliminated. Groups that have difficulty gaining access to credit could be assisted by a scheme under which the initial set-up costs of extending credit could be underwritten by the government in order to reduce transaction costs. Recurrent credit subsidies should not be provided, however. Credit policies should be set with a view to ensuring high loan repayment rates and sustaining lending activities; special credit arrangements should not interfere with liberalization of interest rates. The government should also consider developing an institutional and legal framework that would allow efficient lending to agriculture, unhindered by highly restrictive collateral requirements and seasonal credit regulations.

Recognizing the Role of the Public Sector

Most subsectors of Pakistani agriculture have entered a post-green revolution stage of development that requires new strategies to enhance input efficiency and to maintain and improve the quality of the resource base. By most measures of productivity Pakistan's institutions have not evolved to meet this challenge. Reform in public spending is critical to achieving these institutional changes. The government's new role will require institutional changes but no independent institutional reform should be needed. Some institutions (such as output marketing agencies) will have to be phased out as the reform program progresses, however.

Research

Support for research should continue, but expenditure needs to be restructured so that salaries do not absorb most of the available funds. Research institutions should be made more autonomous, salary restrictions should be lifted, and other funding sources should be mobilized. Training programs for research professionals should help them understand the problems of farming systems, including irrigated agriculture, and publicly funded research should focus on growth-enhancing public goods, environmental impact, poverty reduction, and the transfer of technology.

Greater importance should be attached to research on cropping systems. Wheat fields, for example, are a breeding ground for pests that attack the cotton crop, calling into question the viability of the cotton-wheat system. Improvements in the major cropping systems to overcome such problems as delayed planting and depletion of soil organic matters are needed. Adaptive research, which should be a part of the extension service, should provide site- and season-specific recommendations and information to individual farmers.

Both productivity and sustainability can be enhanced by improvements in crop and resource-management research. Greater attention to local conditions can be achieved by defining major agro-ecological zones and subsystems within these zones, rather than within political boundaries. Such zones could then serve as the basis for organizing crop and resource-management research aimed at monitoring changes in the resource base at the farm level.

Universities should continue to play a key role in providing manpower training for research, and producers, nongovernmental organizations (NGOs), and other participants from the private sector should be encouraged to take part in setting research priorities. Research that can be profitably financed by the private sector need not be underwritten by the limited public budget, although joint public-private funding of research is desirable. Private and public sector research financing could, where possible, be provided on a competitive basis, so that funding to institutions would be tied to performance. Monitoring of research needs to improve—albeit under a system that allows for greater decentralization—and coordination among both national and provincial research institutions improved so that unnecessary duplication is avoided.

Extension Services

Some reduction in the size of the extension service may be necessary, particularly among the cadre of extension agents at the Union Council level, and continued public funding should be contingent on improved organizational capability. Extension already being undertaken by private sector companies and NGOs, such as the provision of advisory services by adaptive research institutions to medium and large farmers on a fee basis, should be encouraged.

Operational management of extension services needs to be decentralized, farmers need to be encouraged to play a larger role in controlling and evaluating these services, and services need to be geared to the problems of all farming systems, including livestock, forestry, and water management, not just those of major crops. A more diversified approach to extension that responds to the needs of farmers, including women farmers, and makes use of all sources of extension services, including the private sector, is desirable.

The “contact farmer” approach, which makes extensive use of audiovisual teaching methods, comprehensive on-farm demonstrations, and farm fairs, should be reconsidered. A group approach to message delivery would complement groups in other areas, notably in water and credit provision.

Education

Greater investment in formal schooling will be critical in raising technical efficiency and productivity. In the short run functional education of farmers can be improved through adult literacy programs and training by government fieldworkers. Such training will also prepare farmers for the increased organizational burden that will be placed on them as a result of the formation of water user associations and other user groups. In the long run more emphasis on primary education will help increase human capital in rural areas.

Rural Infrastructure Provision

The government’s role in providing rural infrastructure needs to be strengthened. The increased revenue from tax reform and savings from the rationalization of public expenditures on agriculture could be used to finance farm-to-village road construction, which would improve the distribution of inputs and the marketability of outputs, especially high-value (often perishable) foods.

Poverty Alleviation

Swift alleviation of rural poverty depends on rapid agricultural growth, which in turn depends on government policy; price reforms that improve the incentives facing farmers are especially urgent. But to achieve growth additional reforms are required to maximize poverty reduction. In a labor-abundant economy such as Pakistan, subsidies on capital (tractors, combine harvesters, and so on) are inappropriate because they distort factor markets and lead to labor displacement. Incentives to mechanize that displace labor without increasing output significantly should be removed.

Provinces should be encouraged to better target their development spending toward the rural poor by giving districts with the largest concentration of poor people higher priority in the allocation of public investment (such as rural roads and health and education facilities).

Rural credit policy should ensure that viable small-scale rural investment opportunities can be efficiently financed. Directed credit, quotas, and interest rate ceilings should be terminated, and the private sector should be relied on for credit provision wherever possible. The government should also consider removing land market distortions, which impair efficiency as well as restrict access to land by the poor.

Participatory community-based organizations also offer great promise in terms of reducing poverty. These organizations could be integrated with groups that provide rural credit. Institution building in rural communities will complement the increased reliance on user groups in water and extension services.

Environmental Protection

To protect the environment the government must place more emphasis on natural resource management problems in agriculture. The lessons of successful resource management suggest that policy interventions should be based on three principles:

- Adjusting prices for scarce natural resources to provide appropriate incentives for conservation
- Identifying regulatory mechanisms that could be effective in addressing market failures, bearing in mind the poor record of existing regulatory agencies
- Restructuring public expenditures to focus on natural resource management priorities.

The government needs to phase out policies, such as the underpricing of irrigation water, that give private agents incentives to use natural resources suboptimally. Factor price distortions that lead to labor displacement and increased environmental stress (farming on marginal land or rural-urban migration, for example) should also be removed. Elimination of subsidies—such as the sapling subsidy, the rationale for which no longer exists—would release resources for natural resource management projects.

Environment and natural resource management problems are often associated with market failure and require public regulation. Increased pesticide use has created growing resistance among pests and destroyed natural predators. One approach would be to adopt integrated pest management techniques that would be more effective against pest problems as well as more environmentally friendly. An effective institutional mechanism for transmitting knowledge about integrated pest management is essential.

Increasing the regulatory powers of government agencies will be counterproductive if they continue to protect the politically powerful, seek rents for themselves, and enforce laws selectively. It may, therefore, be wise to include NGOs in Pakistan's environmental strategy and to support them wherever appropriate and according to their comparative advantage. NGOs have had considerable success in increasing farmers' awareness of environmental issues, have played an important role in formulating environmental policy, and have recorded some notable victories in the civil courts.

Lack of property rights and institutions to manage common property resources can result in onsite damage and create negative externalities. Successful watershed management projects need to be extended and community management institutions established to address common property resource management problems. Government intervention should be limited to providing incentives for the adoption of sustainable resource management techniques, such as new technologies that enhance the physical status of common property resources.

Core Elements of the Strategy

Although all components of this strategy must be implemented to ensure sustainability, certain elements should be implemented first.

Allowing the Market to Operate

Policy reforms that support the ongoing structural adjustment should be given top priority. These reforms include all actions that involve government withdrawal from activities better suited to the private sector. Market forces should be allowed to determine agriculture output and input prices. Trade and tariff policy reform will improve the incentives facing the agricultural sector, ending distortionary policy-induced intersectoral transfers out of agriculture. To make the tax system equitable and nondistortionary, agriculture must contribute its fair share to government revenue, a change that will also improve Pakistan's internal balance and increase stabilization. These reforms will not only help adjustment (including stabilization) but will improve agricultural efficiency and growth as well.

Addressing the Irrigation Crisis

Irrigation is the lifeblood of agriculture in Pakistan. To address the crisis in irrigation management, market-determined incentives (that is, water prices) must be allowed to determine resource allocation within the irrigation system. The scope for raising water charges is considerable and reform here can be implemented quickly. In the longer term decentralization of water provision is essential and preparatory steps should be taken immediately. The government will also have to establish enforceable property rights to water and legalize water markets, thereby making the opportunity cost of water transparent and encouraging more efficient use of water. Administering institutions will have to be restructured along commercial lines.

The best option is to develop autonomous, commercially oriented public utilities on a canal-command basis, ensuring cost recovery of all current operations and maintenance and future capital expenditures. Because the government cannot collect all costs of operations and maintenance from farmers, farmers must become responsible for operations and maintenance through water user associations, which will better maintain the system.

Reforming Extension

Given the potential of increasing the productivity of most crops by 30 to 50 percent, effective diffusion of existing technology and best farming practices is paramount. Reform of extension is critical in four key areas:

- Establishing closer links with research institutions
- Reducing the number of front-line extension workers and replacing them with fewer, better trained workers who are more responsive to the needs of farming systems
- Providing consulting services from adaptive research institutes to better-off farmers on a cost-sharing basis
- Using mass media and other group approaches to communicate basic messages about available technology and better farming systems.

Correcting Distortions in the Land Market

Full-fledged land reform is difficult to enact and can be considered only after a comprehensive study of costs and benefits. Some important measures can be implemented immediately, however. Foremost is providing security of tenure to many farmers, especially tenants-at-will, thereby improving responsiveness to incentives and creating better incentives for long-term investments. Property rights can also be reinforced by improving and streamlining land registration by establishing a system of permanent title deeds. Finally, the government needs to consider eliminating artificial incentives, such as low machinery prices and unequal access to credit, to large holders.

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